Professors A–Z
Biomedical Sciences and Engineering
Business and Built Environment
Computing and Electrical Engineering
Engineering Sciences
Natural Sciences
Faculty of Biomedical Sciences and Engineering

Mission Statement

Our faculty’s research and education is in Bio–Medi–Tech areas having unique and large combination of basic, applied and clinical research in selected scientific areas. Research is organized to three thematic areas:

• Biomeasurement technologies
• Health informatics and systems biology for personalized medicine
• Tissue engineering and cell technologies
Mission statement
My main mission is to develop methods and applications and train students and researchers to cope with data-driven problems in digital society in a creative way. I believe that a thorough understanding of data science is key for preparing our society for the digital revolution.

Research interests
Dr. Emmert-Streib’s research interests include data science, computational biology, network science and digital society.

Top 5 achievements
• Development of machine learning methods for studying interdisciplinary problems in our digital society.
• Patent for Diagnosis and risk stratification of bladder cancer.
• Establishment of an interdisciplinary course in Computational Diagnostics.
• Co-founder and CSO of sAnalytico Ltd, 2013.
• Co-founder of the book series Quantitative and Network Biology at Wiley-VCH.

Main positions of trust
Faculty of Biomedical Sciences and Engineering

Mission statement
The mission is to give M.Sc. and Ph.D. students excellent knowledge and skills to work in challenging positions in companies, hospitals and research institutes carrying out research and development in Medical Physics. This way, we want to strengthen the continuously growing field of high-tech industry as well as the high level of the Finnish healthcare system.

Research interests
Professor Eskola’s research agenda is focused on:
• Quantitative analysis of MRI: the data is used for solving neurological problems, such as brain injuries. It is also an excellent tool for the follow-up of treatments.
• Deep-brain stimulation of epilepsy: by analyzing diffusion MRI, the goal is to improve the outcome and decrease the side effects. The research group conducts research in the hospital in deep co-operation with clinicians and analyzes real patient images.

Top 5 achievements
• Research: Establishment of a Quantitative Medical Image Analysis unit at the Tampere University Hospital, 2007.
• Education: Development of the qualification program for Medical Physicists: Chair of the Finnish Qualification Board several times, author of the national qualification rules. European harmonization in 2008.
• Societal impact: Has been a member of the boards of five companies. Director of technology subgroup in eTampere Information Society Program 2001–2005.
• International activity: Chair and organizer of a number of conferences, Program Chair of the EMBEC & NBC Conference 2017.

Main positions of trust
Member of Council of European Federation of Organisations for Medical Physics, 2011–2014 and Education and Training Committee 2014–. Referee positions in Academy of Finland, Swedish Foundation for Strategic Research, Dutch National Science Foundation and French Research Agency. Reviewer duties for ten scientific journals in the fields of Biomedical Engineering, Medical Physics and Medicine. Reviewer of 22 doctoral theses in Belgium, Finland, Italy and India. Vice Dean and Director of the Doctoral School at the Faculty of Natural and Environmental Sciences 2011–2012, and Faculty of Biomedical Sciences and Engineering 2017–2018. Member of the Council of Academic Engineers and Architects of Finland, 2008–.

Selected publications
Mission statement
To deliver new knowledge and methods for future personalized medicine through advances on 3D bioimaging, cellular biophysics and in-silico modelling.

Research interests
Novel personalized medicine is built on a wealth of data from the individual person. We aim to improve this data and its usage and produce new biological knowledge, novel biomedical methods and tools for future personalized medicine.

My group aims to develop new methods for 3D bioimaging and image based assessment of cellular and tissue functions. We develop optical, electric and X-ray tomographic methods and single plane illumination microscopy for augmenting tissue engineering, in-vitro disease and drug modelling, and future 3D histology.

My group aims to develop in-silico models using data based and numerical methods to decipher the cellular biophysics in epithelial barrier functions and neuronal networks and cardiomyocytes integrating in-silico and in-vitro human induced stem cell personalized and drug screening platforms.

Top 5 achievements
• Fellow, European Alliance on Medical and Biological Engineering Sciences, www.eambes.org 2016
• Coordinator of EU Future Emerging Technology FET-OPEN project Biomimicking the Brain – Towards 3D Neuronal Network Dynamics 3DNeuron
• PI and Finnish co-ordinator, “Innovation Alliance” Project: Information Technology for Assisted Living At Home (ITALH) with The University of Aarhus, Denmark and The University of California Berkeley, USA. Financed in Finland by Tekes and Academy of Finland
• Co-founder of the company Injeq www.injeq.com
• Chair and organizer of many meetings including European Medical and Biological Engineering Conference EMBEC2017 and Nordic Baltic meeting on Biomedical Engineering, 10.6–15.6.2017 Tampere, Finland www.embec2017.org

Main positions of trust
President of the European Alliance on Medical and Biological Engineering 2015–17. President of the Finnish Society of Medical Physics and Biomedical Engineering 2001–04. Head of the Department of Biomedical Engineering, Tampere University of Technology 2008–2012. Member of the board, Institute of Biotechnology (IBT), University of Tampere, 2011–13. Expert in Review panels of the EU funding programs and national science funding institutions in USA, UK, Ireland, Israel, Belgium, the Netherlands, Czech Republic, Finland, Estonia, Norway, Canada.

Selected publications
Mission statement
My mission is to develop automatic systems for handling, treating and characterizing micro- and nanoscale objects by combining knowledge of automation and control engineering with microsystems and nanotechnology.

Research interests
The main research areas include Bio-MEMS, microfluidics, microrobotics and microfabrication applied to two fields: (a) stem cell and tissue engineering and (b) fibre and composite materials.

In cell and tissue engineering, we study mechanical cell stimulation, perfusion and gas supply in portable cell culture systems, hypoxic microenvironments, and organ-on-chip and body-on-chip systems.

In materials research, we apply microrobotics to automate mechanical characterization of fibres, including fibre-fibre and fibre-matrix interfaces.

Top 5 achievements
- Key Member in the Center of Excellence on Body-on-Chip Research and in Human Spare Parts Programme - the first ever funded strategic research project of Tekes.
- The Finnish Automation Award received in 2009.
- Commercialization activities including a spin-off company in 2002, four TUTL commercialization projects and more than 15 national and international patent applications.
- Pioneering microrobotics in fibre research.
- Pioneering microsystems education in Finland since 1997.

Main positions of trust
IEEE Section Chair in Finland, 2012–2013
Chair of the Professor Union’s TUT section 2016–
Vice Chair of COST Actions E54 (2006–2011) and FP1105 (2012–2015)
Member of the Organization Committee in International Conference on Robotics, Manipulation, and Automation at Small Scales (MARSS) 2016–
Member of the Organization Committee in International Conference on Manipulation, Manufacturing and Measurement on the Nanoscale (3M-NANO) 2011–2015.
Coordinator of two EU projects.

Selected publications
Faculty of Biomedical Sciences and Engineering

Prof. Minna Kellomäki

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TUTCRIS, LinkedIn, ResearchGate, Biomaterials and Tissue Engineering Group (BioTE) @minna_kellomaki
Dean of the Faculty of Biomedical Sciences and Engineering
Group Leader of Biomaterials and Tissue Engineering Research Group
Director of BioMediTech Institute
Head of Research Community in Integrated Technologies for Tissue Engineering (ITTE)

Research career
• Dean of the Faculty of Biomedical Sciences and Engineering 2017–
• Director of BioMediTech Institute 2017–
• Director of CoE Body-on-Chip 2018–2025
• Vice Director of BioMediTech Institute 2015–2016
• Professor of Biomaterials and Tissue Engineering 2002–
• Dr. Tech. TUT 2000

Funding
Continuous funding from EU, Academy of Finland, Business Finland (TEKES) since 2003. Current two most important: Body-On-Chip, Finnish Center of Excellence 2018–25, Human Spare Parts strategic research program (TEKES) 2011–18

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Mission statement
We synthesize, functionalize, process and characterize novel biologically suitable materials for medical applications. Close collaboration with cell biologists, clinicians and companies give relevance and focus to the research. The aim is to develop cyto- and biocompatible biomaterials, scaffolds and devices for in vitro and in vivo applications.

Research interests
The main interest areas are:
• Biocompatible and bioabsorbable polymers, composites and hybrid materials for medical and tissue engineering purposes
• Biodegradable electronics
• Body-On-Chip materials and concepts
• Hydrogel synthesis, functionalization and characterization for tissue engineering
• Processing and characterization of 3D tissue engineering scaffolds
• Biodegradable textiles for medical purposes
• Targeted and sustained drug delivery concepts

Top 5 achievements
• Approx. 200 original research and review refereed articles
• Fellow in Biomaterials Science and Engineering (FBSE) in 2008
• Commercialization activities throughout the career; research projects progressed to the commercialization projects, several patent publications, one of the founders of three spin-out companies, CE-marked products out from research
• Pioneered in developing biomaterials and tissue engineering education in Finland

Main positions of trust
• Member of Science Council of TUT 2015–18
• Member of Academic Council of TUT 2014–16
• Member of Research Council for Natural Sciences and Engineering, Finnish Academy 2013–15
• Member of Teknillisten Tieteiden Akatemia, 2015
• Board member of Ragnar Granit Foundation 2015–17
• ESB (European Society for Biomaterials) Council Member 2003–2007
• Board member of Finnish Society for Biomaterials 2000–16
• Member in several educational council boards in TUT and UTA

Selected publications
• Turunen S, et al. (2017). Direct laser Writing of Tubular Microtowes for 3D Culture of Human Pluripotent Stem Cell-Derived Neuronal Cells. ACS Applied Materials and Interfaces. 9(31), 25717–25730.
Mission statement
Our mission is to develop new synthetic materials for soft and hard tissue regeneration. The main focus is on bioactive and bioresorbable glasses and polymer/bioceramics composites. Materials are processed into frits, bulks, fibers or scaffolds depending on the intended application: i.e. bone, cartilage or nerve regeneration.

Research interests
Our research focuses on
• the processing and characterization of new bioactive materials with controlled therapeutic ion release
• a better understanding of biomaterials/cells and biomaterials/protein interactions
• developing scaffolds with load-bearing properties
• combining the optical and bioactive properties of glass to develop new biosensors and/or materials imaging techniques (biophotonics)

On a daily basis we study the chemical, structural, mechanical and physicochemical properties of a wide variety of materials, i.e. from polymer to ceramics for application in the medical field.

Top 5 achievements
• >50 publications in international peer-reviewed journals, H-index=14. >60 presentations at international conferences (including 6 presentations as invited speaker).
• Invited Professor and invited lecturer at Rennes University (France), Politecnico di Torino (Italy), University Cergy-Pontoise (France), University of the Witwatersrand, Johannesburg (South Africa), Friedrich-Schiller-University Jena (Germany).
• Chair and organizer of a number of conferences.
• Processing of the first biophotonic scaffolds.

Main positions of trust
Director of the MSc degree programme in Biomedical Sciences and Engineering
Reviewer for over 20 international journals in the field of Materials Science and Biomaterials
Member of the American Ceramic Society (ACerS)
Member of the technical committee on bioactive glasses (ICG-TC04)
Editorial Board: Biomedical Glasses
Associate Editor: Tissue Engineering & Regenerative Medicine: Open Access
Local Organizer: EMBEC & NBC 2017, Tampere; Finland
International advisory committee member: ESB2018; ICAFMC2018

Selected publications
• Erasmus E., Jonhson OT, Sigalas I., Massera J., "Effect of sintering temperature on crystalization and fabrication of porous bioactive glass scaffolds for bone regeneration", Scientific Reports, 7 (1) 6046 (2017)
Mission statement

Our mission is to do interdisciplinary research addressing major biological challenges using the biopolymers produced by our cells 'the extracellular matrix (ECM)'. Using these polymers, we engineer biomaterials for medical applications, such as targeted drug and gene delivery, cancer treatment, tissue regeneration and cell therapy.

Research interests

**Engineering nanocarriers:** We engineer nanocarriers using biopolymers for targeted delivery of small molecule drugs and nucleic acids. By this strategy we aim to improve the bioavailability and mitigate the toxic side effects or off-target effects of the drugs.

**Regenerative medicine:** We engineer 3D scaffolds using ECM derived polymers for bone and cardiac Tissue Engineering and 3D cell culture. Hydrogels engineered from these polymers mimic tissue microenvironment and provide ideal cellular niche for culturing adult stem cells and other mammalian cell lines.

**Immunosolation of cells for transplantation:** One of the primary goals of our research is to develop novel cell-surface coating strategy to improve the in vivo survival and therapeutic outcome of clinically relevant cells such as mesenchymal stem cells and islet cells.

**Immunomodulation of drugs and material surfaces:** The adverse side effects of chemotherapeutic drugs and implantable materials are due to the activation of immune system. We aim to mitigate the interaction of materials and drugs with blood components by developing antifouling surfaces and encapsulation of toxic drugs in different nanoformulations.

**Novel bioconjugation strategies:** Organic chemistry is the core of our research and we always look for new endeavors to develop novel chemistries that could be performed under aqueous conditions in the presence of cells.

Top 5 achievements

- Co-founder of Uppsala Therapeutics AB, an SME developing next generation nucleic acid therapeutics.
- Discovered a unique siRNA design that overcomes the major hurdles of siRNA delivery (PCT/EP2016/072466); Developed an efficient drug delivery systems that mitigates the side effects of chemotherapy (Chem Commun 2016, 52, 966–969).
- Recipient of the ‘Vision Prize’ of Uppsala University in 2014 for discovering cell-penetrating siRNA or cpRNA.

Main positions of trust

Scientific board member of European Chapter Meeting of the Tissue Engineering and Regenerative Medicine International Society
Expert reviewer for grant application in ‘Discipline for Physical Sciences and Engineering’ for the National Science Center, Poland

Selected publications

Mission statement
We study the dynamics, structure and information storage and propagation in prokaryotic genetic networks. We aim to better understand natural genetic circuits so as to engineer robust, sensitive and resilient synthetic circuits that will assist in key problems in medicine and create sustainable environments, food and energy sources.

Research interests
- Gene Expression Dynamics
- Gene Regulatory Networks
- Models and Simulators of Biological Systems and Processes
- Systems Microbiology
- Signal Processing of Biological Systems
- In vivo Single-Cell and Single-Molecule Biology
- Information Processing and Storage in Biosystems
- Adaptability and Robustness of Genetic Circuits
- Synthetic Biology of Genetic Circuits
- Animal Learning and Behaviour

Top 5 achievements
- 88 peer-reviewed journal articles, 43 peer-reviewed conference proceedings articles, 64 peer-reviewed conference abstract/posters, 13 peer-reviewed book chapters, 1 edited book, 1568 citations, h-index 21 (Google Scholar)
- Supervised 13 PhD and 16 MSc theses, and the students have continued their scientific studies in world leading universities
- 2011 - Scientific Achievement Award for contributions to Signal Processing for Systems Biology conferred by Tampere University of Technology, Finland
- 2013 - Award for Teaching activities conferred by Tampere University of Technology, Finland
- 2014 - Award (as supervisor) for best PhD thesis of the year of Tampere University of Technology, Finland

Main positions of trust
Member of the Portuguese Physics Society since 2001.
Member of the Canadian Society for Systems Biology since 2006.
Associate Editor for BMC Bioinformatics
Associate Editor for In Silico Biology

Selected publications
- AS Ribeiro and J Lloyd-Price (2007) Bioinformatics 23(6), 777–9
Mission statement
The main theme of my research is to study the use of novel materials in micromechatronics and -fluidics. In particular, I work on soft, adhesive, biological and bioinspired materials and their applications in microsystems, -assembly, -robotics and -fluidics.

Research interests
The key areas we are working on are:

**Wetting**: Fabrication of patterned superhydrophobic / oleophobic substrates, characterization of superhydrophobic surfaces, modeling

**Adhesion**: Fabrication of gecko-inspired microfibrillar adhesives, characterization of adhesives using JKR-type measurements

**Rapid prototyping**: 3D printing, castable elastomers, integration of electronics into soft devices

**Micromanipulation**: Surface-tension-driven self-alignment of microcomponents, acoustic micromanipulation

Top 5 achievements
- Publications: 30, h-index: 11
- Demonstration of a switchable adhesive surface with one of the highest switching ratios ever reported: at least 2000-to-1 (Adv. Mat. Interfaces. 2014).
- A surface on which the apparent contact angle of a low surface tension liquid (hexadecane) is practically 180° (Adv. Mat. 2013).
- Controlled acoustic manipulation of multiple objects using only a single acoustic source (Nat. Commun. 2016).

Main positions of trust
- Reviewer for high-impact journals e.g. Lab on Chip, Sensors and Actuators A: Physical, IEEE Sensors and IEEE Transactions on Robotics
- Member of the biomedical sciences and engineering doctoral programme’s steering committee

Selected publications
Mission statement
The mission of my research work is to create a new body-centric wireless technologies for healthcare applications. Possible application areas include:

- Health monitoring and proactive healthcare
- Home care solutions for aging population
- Wireless brain machine interface
- Intracranial and intra-tissue pressure sensing

Research interests
Research of Wireless Identification and Sensing Systems Research Group (WISE Group) concentrates on:

- wireless biomedical sensors and wireless health technologies
- implantable and body-centric antennas
- wireless data and power transfer in biomedical sensing systems
- novel antenna and sensor materials and their manufacturing methods.

Top 5 achievements
- United States Patent US6819243
- Wireless implantable systems for monitoring intracranial pressure
- Textile-based wearable antennas and components for body-centric wireless systems
- Tekes ELO-program Award on Research Excellence 2006

Main positions of trust
Member of the ICT Committee of Chamber of Commerce of Rauma,
Member of the Board of Satakunta Centre of Expertise in Ubiquitous Computing
Member of the Board of Rauma Higher Education Development
Chairing the ACES 2010 Conference in Tampere, Finland.
Member of the Board of Development Centre of Rauma, 2007–2010

Selected publications
Mission statement
The mission of the Nanoscale Phenomena and Measurements (NPM) research group is to measure, understand and exploit the nanoscale phenomena occurring in bio-based nanomaterials and devices. Developed biomaterial structures and devices are widely applicable for biomedical applications.

Research interests
Recent research topics:
- Piezoelectric sensors
- Supercapacitors
- Energy harvesting and storage systems
- Biomedical microdevices
- Biomeasurements
- Processing and characterization of nanomaterial and biomaterials
- Scalable manufacturing using printing techniques

Research infrastructure:
- Piezoelectric sensitivity measurement system
- Equipment for electrical and electrochemical measurements
- Multi-material biomaterial printing equipment (for plastics and biological materials)
- Freeze-drier equipped with heat-controlled shelf in the chamber

Top 5 achievements
- 48 publications, 6 invention disclosures, 495 citations, H-index 13 (Scopus 2017).
- Consortium project funded by the Academy of Finland. Functional human cell based cardiovascular model for biomedical research and testing, 2017-2021.
- Reviewed 28 International Scientific Journal Articles, e.g. in ACS Nano; Advanced Functional Materials; Nano Energy; Cellulose, Nanoscale; IEEE Sensors.

Main positions of trust
Faculty council member & Faculty steering group member, Faculty of Biomedical Sciences and Engineering (BioMediTech), TUT, Tampere, Finland, 2015-present.

Pre-examination of 1 dissertation from Aalto University, Finland.
Acted as a chairperson in 3 conferences. World Congress IMEKO 2015, Prague, Czech Republic. MSW 2016, Lund, Sweden. EMBEC & NBC 2017 Tampere, Finland.


Selected publications
Mission statement
The mission of my research work is to improve the quality of life with a new generation of intra-body and on-body sensing technologies for disease treatment and health monitoring. Possible application areas include:
• Proactive healthcare
• Monitoring and treatment of intra-body diseases
• Home care solutions for the aging population
• Wireless brain machine interface
• Intracranial and intra-tissue pressure sensing

Research interests
Research of Wireless Identification and Sensing Systems Research Group (WISE Group) concentrates on:
• wireless biomedical sensors and wireless health technologies
• implantable and body-centric antennas
• wireless data and power transfer in biomedical sensing systems
• novel antenna and sensor materials and their manufacturing methods.

Top 5 achievements
• Mm-size implantable antennas and wireless power transfer methods for wireless brain-machine interfaces and other brain-implantable systems
• Wireless implantable systems for monitoring intracranial pressure
• Textile-based wearable antennas and components for body-centric wireless systems
• RFID-based solution for identification of industrial paper reels (IEEE Transactions on Automation Science and Engineering Best Paper Award 2009)
• Selected awards: Young Scientist Award 2010 of Finnish Foundation for Technology Promotion, Suomen liike- ja virkanaisten liiton Vuoden nainen 2014/Business and Professional Women (BPF) Finland, Woman of the Year 2014

Main positions of trust
Academy of Finland, Member of the Research Council of Natural Sciences and Engineering, 2016–2018
IEEE Antennas and Propagation Society (AP-S) Administrative Committee Member, 2013–2015
Associate Editor of IEEE Transactions on Antennas and Propagation, 2016–2019,
Associate Editor of IEEE Transactions on Automation Science and Engineering, 2012–2015
Management Committee Member and Finnish Coordinator of European Co-Operation in Science and Technology (COST) Action IC1301 Wireless Power Transmission for Sustainable Electronics (WiPE), 2013–2017

Selected publications
• Khan MWA, Sydänheimo LT, Ukkonen AL, Björninen TM. Inductively Powered Pressure Sensing System Integrating a Far-Field Data Transmitter for Monitoring of Intracranial Pressure. 2017. IEEE Sensors Journal, Accepted, published Online First.
Economical challenge caused by the aging population to the healthcare system as well as improving the quality of healthcare are the driving forces of our research. We are working mainly in the area of human physiological monitoring, developing methods for solving real-life challenges in collaboration with clinicians and often with industry.

My research group, Sensor Technology and Biomeasurements, concentrates on the research and development of embedded measurement technology for physiological monitoring as well as related signal processing and data analysis methods. In addition, we study electronic nose techniques for clinical applications. In our current research projects we are developing: wearable multiparameter monitoring systems, signal processing methods for the estimation of vital signs, assessment of vascular condition based on arterial pulse waveform analysis, and ion mobility spectrometry for tissue classification.

55 peer-reviewed scientific articles (by the end of 2017).
Northern Europe Ni Engineering Impact Award (Biomedical Category), 2016.
Helping industrial collaborators in developing commercial products: e.g. ECG and heart rate monitoring system for group rehabilitation of coronary artery patients, Wearable wellness motivator device for supporting permanent lifestyle change.
Organizing several clinical investigations of medical devices in collaboration with hospitals and industrial and academic partners.

Assistant Professor (tenure track) in Faculty of Biomedical Sciences and Engineering since November 2017.

Docent, TUT, 2017–
Postdoctoral researcher, TUT 2015–2017
Teaching associate, TUT, 2011–2014
Researcher, TUT, 2004–2010
DSc (tech), TUT, 2015
MSc. TUT, 2004

Business Finland: Challenge Finland 2016–2018
Business Finland: VitalSens Finland-India joint research project 2014–2018.


Asst. Prof. Antti Vehkaoja
ORCID: 0000-0003-3721-3467
TUTCRIS Portal, LinkedIn, Google Scholar

Assistant Professor (tenure track) in Faculty of Biomedical Sciences and Engineering since November 2017.

Docent, TUT, 2017–
Postdoctoral researcher, TUT 2015–2017
Teaching associate, TUT, 2011–2014
Researcher, TUT, 2004–2010
DSc (tech), TUT, 2015
MSc. TUT, 2004

Business Finland: Challenge Finland 2016–2018
Business Finland: VitalSens Finland-India joint research project 2014–2018.


Asst. Prof. Antti Vehkaoja
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Assistant Professor (tenure track) in Faculty of Biomedical Sciences and Engineering since November 2017.

Docent, TUT, 2017–
Postdoctoral researcher, TUT 2015–2017
Teaching associate, TUT, 2011–2014
Researcher, TUT, 2004–2010
DSc (tech), TUT, 2015
MSc. TUT, 2004

Business Finland: Challenge Finland 2016–2018
Business Finland: VitalSens Finland-India joint research project 2014–2018.

Mission statement
Data-driven and predictive models and methods for complex systems. Multidisciplinary approach with applications in self-organising systems in humanities, systems biology, and personalised medicine, especially in prostate cancer research.

Research interests
Computational methods development for detection and analysis of heterogeneity in glial cells and glioma tissue, funded by Academy of Finland (2016–2022):
- Image analysis methods for segmentation of glial cells
- Tracking of heterogeneity and drug signaling communication in 3D glial cell culture
- Computational methods for analyzing intra tumor heterogeneity in glioma tissue
- Methods for tracking of multiple signals from the multicolor image of glial cells and tissue

Model-based research on self-organised criticality aiming at predictive capacity:
- Functional features of the attractor structure on a variety of network models
- Adaptation of known or estimated network structures to mean field models
- Model simulation using Monte Carlo methods
- Efficient use of big data in social sciences, biology, and medicine

Improving the efficiency of multidisciplinary research through:
- Use of mathematical models to improve communication between disciplines
- Efficient and unbiased visualisation through new technological means and knowledge of human visual experience

Top 5 achievements
- We have pioneered the realistic simulation of biological imaging based measurements as a benchmarking tool for algorithm development (Nykter et al BMC Bioinformatics 2006, Lehmussola, IEEE Transactions on Medical Imaging 2007)
- Supervised 30 doctoral theses in Tampere University of Technology
- Successful commercialization of research by spin off companies (E.g. Genevia Technologies Ltd, Quva Ltd, Bioptrima, Euformatics)

Main positions of trust
Affiliate Professor in Institute for Systems Biology, Seattle, WA, 2008 onward.
Scientific Advisory Board in Medical and Biomed. Technology, KTH, Stockholm, Sweden, 2010
Estonian Research Council, Nationwide evaluation of IT research, 2014
Editorial board membership of the Chinese Journal of Cancer 2011–

Selected publications
- Granberg et al, Strong FGFR3 staining is a marker for FGFR3 fusions in diffuse gliomas, Neuro-Oncology, Volume 19, Issue 9, 1 September 2017, Pages 1206–1216.
- Ylipää et al, Transcriptome sequencing reveals PCAT5 as a novel ERG-regulated long non-coding RNA in prostate cancer, Cancer Res 2015
Faculty of Business and Built Environment

Mission Statement

The multi-disciplinary Faculty of Business and Built Environment is internationally recognized for its high-quality research and education. Our research concentrates on the themes of sustainable technology-centric competitive advantage and sustainable built environment. In close cooperation with industry we seek answers to questions such as (1) How knowledge and resources are created and utilized in order to conduct efficient and effective value creation activities and operations? (2) What resources and knowledge are needed during the industry evolution to sustain competitive advantage in technology-centric, dynamic environment? (3) What key knowledge and innovations can best serve society to build, operate and maintain a safe, user-oriented and sustainable built environment?
Mission statement
My mission is to develop better understanding on how to turn technologies into business, through commercialization, technology marketing and business ecosystems. This mission requires integration of knowledge from different disciplines and collaboration over boundaries between academics, business and technology experts.

Research interests
My work and research interests are in the intersection of business, engineering and innovation.

The key areas:
- Innovation commercialization: competences, process and networks
- The role of networks and ecosystems in innovative business: Innovation networks, industrial networks, innovation ecosystems, business ecosystems around innovations
- Collaboration for innovation, open innovation
- Innovation business and technology start-ups
- Circular economy: business perspective
- Healthcare technologies: business perspective
- Customer references in digital era, electronic WOM
- Relationship initiations in different contexts

Top 5 achievements

- Emerald Citations of Excellence Award 2015 and the most cited paper in IMM 2017: Article on value creation by Aarikka-Stenroos & Jaakkola 2012
- Highly Commended Award 2016 by Journal of Service Management on the article Jaakkola, Helkkula and Aarikka-Stenroos 2015
- Successful crossdisciplinary collaborations while developing academic research and academic education in Tampere3 and TUT: for example Y-Kampus launched in 2016 and a novel study module for Circular Economy in 2018

Main positions of trust
Scientific committee of IRSSM-7
Editorial board of Journal of Business and Industrial Marketing
A member in Advancing Service Research (ASR) Group (the Journal of Service Management)
A founding member of ISPIM Special Interest Group Platforms and Ecosystems

Selected publications
Mission statement
My mission is to understand the nature and implications of ongoing discontinuous change in the production and value creation logics within project-based industries such as construction, shipbuilding, and provisioning of complex products and systems.

Research interests
My research focuses on diverse inter-organizational phenomena in project-based industries, including:

- Project networks
- Management of complex projects
- Inter-organizational relationships in project business
- Circular economy projects
- Purchasing and supplier management
- Project marketing
- Management of project-based firms

Top 5 achievements
- Best reviewer prize: Project Organising Strategic Interest Group, European Academy of Management Conference, June 2016
- Outstanding Paper Award Winner - Emerald Literati Network Awards for Excellence 2013

Main positions of trust
Chairman of the Scientific Board, Project Management Association Finland (PMAF) since April 2016
Responsible for a 5-day course on Project Business as invited teacher to Doctoral Summer School 2016 organized by Shanghai University, Shanghai, China
Member of Scientific Programme Committee for CIB World Building Congress 2016
Co-edited the EGOS 2013 Temporary and Project Organizing subtheme special issue published in the International Journal of Project Management in 2014
Secretary for EGOS 2013 Temporary and Project Organizing subtheme Research track main organizer in EURAM 2012, Client Capabilities track

Selected publications
Mission statement
My mission is to increase knowledge and capabilities for the ongoing transformation of the manufacturing industries and how manufacturing firms in a small and open economy like Finland can remain competitive in the global business markets.

Research interests
My research focuses on the competitiveness of the Finnish manufacturing industry in the context of the turbulent global business environment and improvement of operations systems both in manufacturing and services. The key areas of my research are as follows:

• Manufacturing and service operations systems
• Operations strategy
• Production planning and control
• Production location decisions, offshoring and reshoring
• Supply and demand chain management
• Purchasing and supply management, particularly value creation in complex purchasing situations

Top 5 achievements
Over 80 publications, including peer-reviewed journal articles, conference papers, books and monographs, book chapters, research reports, case studies for teaching, and popularization of research results.

• Advisor and examiner to 62 Master's thesis since 1995.
• Doctor of Science (Technology) degree from Helsinki University of Technology, Department of Industrial Engineering and Management, and an MBA degree from Webster University, St Louis, USA.
• In addition professional training at IMD in Switzerland, MIT Sloan School of Management in the USA, University of Oxford, Templetton College in the UK, and Chamber of Commerce in Finland.

Main positions of trust
Member of the Finnish Publication Forum Economics Panel in 2018-2021.
Mid-Term Evaluator appointed by the Danish Industry Foundation for research project “Sourcing Excellence 2011-2016”, Center for Industrial Production, Aalborg University, Denmark.
Member of Organizing and Scientific Committee in the ICAM International Conference on Agility, International Society of Agile Manufacturing, Espoo, Finland, 2005

Research career
• Senior Researcher, TUT
• Senior Lecturer, Aalto University,
• Chief Research Scientist, VTT Technical Research Centre of Finland
• Research Director, Helsinki University of Technology
• Research Associate, International Institute for Management Development – IMD, Lausanne, Switzerland

Funding
Total research responsibility since 1997 exceeds 4 million Euros, most recent projects Reshoring of Manufacturing by Tekes in Finland and VINNOVA in Sweden, ProcuValue by Tekes, Metsä Group, Posti Group, Tieto Oyj and Valmet Oyj

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Selected publications

Mission statement
My passionate is in interdisciplinary research, where theoretical foundations are searched from other scientific disciplines, too, in order to find best solutions for the turbulent business environment and the contemporary, wicked problems.

Research interests
The key research themes are:
• knowledge management, especially inter-organizational knowledge sharing
• knowledge work, especially the impact of digitalization on work
• digital and data based value creation
• stakeholder experience and emotions
• value co-creation

Top 5 achievements
• Over 120 publications, including 90 international referee publications
• Leader experience in over 20 research projects
• Supervisor of several PhD theses and over 40 M.Sc theses
• Teaching experience in four different universities as responsible teacher in altogether 30 different candidate and master level courses
• Interdisciplinary study background – studies in management, marketing, software engineering, law, health sciences, sociology

Main positions of trust
• Guest Editor, Special Issue on “Value creation in service networks”, International Journal of Services Sciences, 2016
• WORK2015 and 2017 conferences, co-chair of stream “Digitalization at work”

Selected publications
Mission statement
Seinäjoki Urban Laboratory approaches built environment comprehensively, emphasizing future orientation. Different scales and disciplines of architectural design converge, as the laboratory explores new professional practices and methods for highlighting built environment and architecture as a resource— not only from economic and ecological standpoints, but socio-cultural as well.

Research interests
Laboratory’s research projects are commonly multi-disciplinary including collaboration with cities, municipalities, private companies and universities. This is excellently supported by the regional context of the laboratory and its location at the University Centre of Seinäjoki, where 20 research units from six universities intermingle daily. Laboratory’s research themes cover a wide range of topics including, for example:
• Circular and bio economy in urban contexts: timber construction, renovation, urban food systems.
• Adaptability and resilience of urban communities: cities as innovation environments.
• Human-centred planning and design theory: organic architecture, research on Alvar Aalto’s life work.

Top 5 achievements
• Member of the Epanet professor network at the University Centre of Seinäjoki since 2009.
• Co-founder and leader of the EDGE laboratory for urban research at TUT School of Architecture 2005-2009.
• Leader of the research team in the project “Future scenario for the regional structure and the transportation system of Finland”, 2013-2014, Ministry of Environment.
• Founder and leader of a private architects studio in Eastern Finland, 1987-1996.

Main positions of trust
• 2018-2021, Member of a panel, Publication Forum, Finland.
• 2017-, Board member of the Nordic Association of Architectural Research
• 2012, Evaluation of the preparatory process of the structural model for the Tampere urban region.
• 2012-2013, Membership in the jury of the architectural competition of the Hangonsilta area, Hyvinkää, Finland, nominated by SAFA, Finnish Association of Architects.
• 2006–2010, Member of the working group Creative Tampere business development programme, theme group “Creative Structures”.

Selected publications
Mission statement
The mission is to develop and implement methods for empirical finance and risk management employing large and rich datasets. This research is not only academically but also practically relevant to financial supervisory bodies and the private sector. Emphasis is put on exploiting data science techniques.

Research interests
Kanniainen’s research agenda is focused on
- derivative pricing and financial econometrics
- order book dynamics and liquidity
- financial networks
- social networks and decision making (a new topic, research in progress).

Methodologically, Kanniainen has taken steps towards data driven research and currently his interests lay in
- econometrics and statistical methods in general
- machine learning
- complex networks

This combination of questions and methods allows us to gain understanding in financial markets as a highly non-linear and complex system. The results can be exploited by supervisors for better monitoring and investors for robust risk management and successful trading strategies.

Top 5 achievements
- Coordinator of two international EU-programs, BigDataFinance (www.bigdatafinance.eu) and HPCFinance (www.hpcfinance.eu).
- Research award (University’s 50th Anniversary Gala), 2,000 EUR, Nov 2015, TUT.
- Teaching awards: Awarded by the Department of Industrial Management for excellence in teaching in 2011 and 2015. The teacher of the year 2009 and 2016 in Industrial Management (elected by the students).
- Chair and organizer of a number of conferences, including Conference on Big Data in Finance, London 2017.

Main positions of trust
Member of Collaboration Forum for Scientific Computing; Ministry of Education and Culture, Member of Scientific Council at TUT; Expert in a review panel of the European Union programs, Editor of Chapman and Hall/CRC book on “High-Performance Computing in Finance: Problems, Methods, and Solutions”; Deputy Head of Department (2014-2016)

Selected publications
Mission statement
I want to be a good teacher to architect students and the best researcher in Finland in the field on wood architecture and wood construction, especially wooden multi-story apartment buildings.

Research interests
I have been advancing Finnish large-scale industrial timber construction (multi-story timber apartment buildings, wooden public buildings) full time from the year 1995 –.

My main research tasks are:
• Competitiveness of multi-story timber apartment buildings
• Possibilities of wood in repairing facades of old concrete block of flats and usage of wooden modules in building additional floors in the top of those buildings.

Top 5 achievements
• Awarded with Puumies magazine’s 14th Wood Sector Communication award, 2.9.2015
• Awarded as the University of Oulu, Department of Architecture’s Wood Studio’s project manager with Rakennustietosäätiö RTS’s Oulun Rakennustieto award, 9.12.2009
• Awarded with the national Puupalkinto 2003 award for participation in the realization of Oulu’s Puu-Linnanmaa, 26.9.2003
• Doctoral thesis was awarded with the University of Oulu, Department of Architecture’s post-graduate degree award, 25.2.2003
• Awarded with the Finnish mechanical wood sector development Rantasalmi award, the so-called ”Puu-Finlandia” award together with Professor Jouni Koiso-Kanttila, 26.10.2000
• Master’s thesis was awarded with STS / KAL’s national Master’s thesis award, 19.4.1989

Main positions of trust
Ministry of Employment and the Economy (TEM): Head of development of the national timber construction program (job description: leader of the government’s timber construction program and top national specialist in timber construction); 2012–2015
Project manager of the national Modern Wooden Town project; 1997–2011
Lecturer and assistant in the architectural design laboratory of the University of Oulu, Department of Architecture; 1992–1997

Selected publications
Mission statement
My research mission is to develop sustainable and from the life cycle point of view cost-efficient solutions to build and maintain road and railway networks and other types of infrastructures. Any research project is not completed before it has some effect in real world operations.

Research interests
My research interests cover:
- mineralogical materials used in the construction of roads, railways and other types of infrastructures, including both natural, man-made and alternative materials like side products from different types of industrial processes
- design and construction methods of infrastructures
- methods for cost-efficient maintenance and renovation of road and railway networks
- geotechnical problems related to various types of infrastructures.

One of the key issues in completing my research mission is to take use of the emerging digital technologies that enable real-time monitoring of the performance of e.g. road and railway structures and provide affordable tools for inventorying the condition of our extensive traffic networks. Modern data processing technologies are of great help in transferring these inventory data to optimal asset management solutions.

Concerning roads the latest focus area has been in studying the loading effects of super heavy trucks recently introduced and autonomous vehicles going to be introduced on our roads in the near future.

Top 5 achievements
I have had the privilege to be a member of a team that has:
- become a nationally leading and internationally identified research group on its field
- developed our geotechnical laboratory on a high international level
- produced research results that have helped the Finnish Transport Agency to save tens of millions of taxpayers money in maintaining our road and railway networks
- educated students that have won a number awards and prizes in different types of competitions
- produced a number of successful continuation education courses for practitioners

Main positions of trust
Transportation Geotecnics Journal, Editorial Board
WASCON 2018, Scientific Committee
ISSMGE, TC202 Transportation
CEN TC341 WG6, Laboratory test on soils

Selected publications
Mission statement
My mission is to turn the traditional approach of history of architecture into a design discipline. As the building stock in Finland is getting older, it is evermore important to figure out culturally, historically and technically sustainable ways to transform and maintain the built heritage for future generations.

Research interests
My research interests are tightly connected to the transformations and management of built heritage in Finland. I have been researching the problematic of infill architecture in various Finnish environments: how to enhance and safeguard the qualities of historical sites while adding new built layers, how to prolong the life cycles of buildings by using sustainable restoration and transformation methods. At the moment I'm working on the history of the concept of "Wooden town" and adaptation of the new ideas of Conservation Management Plans for Finnish conditions.

Top 5 achievements
I consider my top achievements to be the series of five courses of history of architecture, that I have developed during the last years: 1\textsuperscript{st} year students study how to make minor interventions based on general knowledge of history, 2\textsuperscript{nd} year students learn to rehabilitate historical wooden buildings and sites, 3\textsuperscript{rd} year students learn to analyze the designing methods and goals of the modern movement tradition, 4\textsuperscript{th} year students learn to design restorations and transformations for demanding built entities and 5\textsuperscript{th} year students learn to use the theories of restoration in practice.

Main positions of trust
Member of the editorial board of Architectural Research in Finland

Selected publications
Mission statement
To develop mathematical models and efficient numerical solution methods for challenging engineering problems.

Research interests
My research interests cover problems in non-linear continuum mechanics including multi-physical problems and their numerical solution methods.

- Fatigue analysis methods: HCF, LCF, creep fatigue
- Constitutive models
- Magneto-electro-thermo-mechanics
- Finite element methods
- Stability analysis of structures

Top 5 achievements

- R. Kouhia and M. Mikkola, Tracing the equilibrium path beyond compound critical points, *IJNME*, 46, 1999, 1049–1074

Main positions of trust
International Union of Theoretical and Applied Mechanics, member of general assembly
Nordic Association of Computational Mechanics, member of the executive committee
European Journal of Computational Mechanics, associate board member
Rakenteiden Mekaniikka, member of the editorial board
Finnish Association for Structural Mechanics, member of the administrative board
Finnish National Committee on Theoretical and Applied Mechanics, secretary

Selected publications

Mission statement
My mission is to understand and enable novel more open forms of IT-supported collaboration, communication, matchmaking and external information and knowledge sourcing, as well as related value creation and value co-creation in companies especially in industrial and B2B-contexts. This is useful, for instance, for creating and developing new practices for open innovation and customer understanding.

Research interests
My research is focused on e.g. the following topics:
• Novel value creation and business models (especially in industrial manufacturing companies (e.g. IoT- and Industrial Internet-related))
• New collaboration forms (e.g. platforms, communities, social media and crowdsourcing) and related information sourcing and data analytics in innovation and business
• Information and knowledge management in innovation and product development

Methodologically, I have previously focused more on qualitative research approaches, but have more recently focused increasingly on data-based and data driven research, including big data-related research. This combination allows a more in-depth understanding of the above research topics and interests.

Top 5 achievements
• Coordinator of COBWEB Academy of Finland project
• One of the main organizers of Tekniikan päivät “Tiedon valossa” (Technology Days Event) of Tampere 22-24.10.2015, among with many other events and conferences
• Scientific board member of several international conferences (e.g. ISPIM, PLM,…)
• Research award (University’s 50th Anniversary Gala), Nov 2015, TUT.

Main positions of trust
Responsible leader of the International Federation for Information Processing Working Group on Global Product Development (IFIP Working Group 5.1)
Special Interest Group of Product Lifecycle Management Maturity
One of the Founders of CMAD Finland Community
Head of Information and Knowledge Management Degree Programme 2008-2016

Selected publications
Mission statement
My mission is to search, learn and teach architecture as an art and as part of the society.

Research interests
My research interests are tightly connected to architecture itself:
• Modern architecture
• Atmosphere
• Space
• Place
• Light

Top 5 achievements
My top achievements are tightly connected to teaching and being as an architect:
• Basics of Architecture, Professional course of architecture.
• Examined master thesis.
• Venetsia biennal of Architecture, 2016, 2017, 2018
• Finlandia Price for Architecture, SAFA( member of group ) 2014
• Architectural work and competitions

Main positions of trust
State Architecture Commission, member of the board, 2009-2011
Kaupunkikuvatoimikunta, City of Tampere, member 2011-
Editorial board of Arkkitehti-magasin, member, 2011-
Gerda and Salomon Wuorio foundation, member of the board, 2001-2014
Working committee of new learning environments, RT, member, 2017-

Selected publications
• Lahdelma & Mahlamäki Architects; Works, Rakennustieto 2014
• Echoes – 100 Years in Finnish Design and Architecture, exhibition, Suomi 100-organisation, Prime Ministers Office, 2017
• Lahdelma I., Muistin olomoja ja käytettävyys, Muistin palat, Suomen museot ja kirjastot, Finnish Architectural Museum, 2008
Mission statement
My mission is to enhance the competitiveness of organizations through a better understanding about the economic impacts of various business activities from multiple perspectives. Interventionist research approach is a basis for identifying and responding to these theoretically inspiring, yet practically and societally relevant challenges.

Research interests
My work and research interests are in the intersection of profitability management, innovation and business development.

The key areas of my research interests are the following:

- accounting and control for service business development and servitization
- managing and controlling the economic impacts of innovations and New Product Development, featuring advanced Business Impact Analyses (BIAs)
- accounting development for supporting managerial work at different levels
- designing integrative, ergonomic and interactive accounting tools to enable decision-making, management and well-being within organizations
- developing and utilizing actor approach and pragmatic constructivism for better understanding and enabling business development within organizations
- developing and utilizing interventionist research approach as a vehicle for theory advancements, in response to the timely societal and business challenges.

Top 5 achievements

- Successful completion of several large-scale research projects, that represent development and utilization of interventionist research approach 2003-2018, involving more than 30 major companies and substantial international collaboration
- Managing and developing Cost Management Center research team in a close international collaboration, to identify and respond to the timely business challenges on profitability management, with theoretical, practical and societal implications

Main positions of trust
Co-Editor of a journal: Co-editor in Proceedings of Pragmatic Constructivism (4/2017-)
Guest editor: Qualitative Research in Accounting and Management, “Accounting and Innovation” (2018, Forthcoming)
Guest editor: Journal of Management and Governance, “Service Business Innovation: Implications on Governance, Management Accounting and Control” (Forthcoming)

Selected publications
Mission statement
Towards Experiential Urbanism – planning and policy for the Urban Society of the future.

Research interests
The focus of my research is innovation in urban planning and new spatial practices:

**NICHES – nurturing new ideas**
Place-based innovation, temporary uses and grass-roots approach to renewing urban processes. In architecture new experimental typologies of housing and urban blocks, self-building, group-building, and co-operatives.

**REGIME – challenging the established actor-network**
Development and critique of existing professional practices and the actor-network of real-estate sector. Institutional development of planning and urban management, re-thinking tools, roles and responsibilities.

**LANDSCAPE – preparing for systemic change**
Reflecting and critically rethinking societal and conceptual structures, economics, cultural connotations and the legal base of urban planning, development and management.

This agenda is set in the TUT context where urban modeling, parametric design and research in new materials are already present, providing excellent basis to explore new methods and tools.

Top 5 achievements
- Achieving continuity and quality in the research of Tampere School of Architecture through academic leadership and successful applications to Finnish Academy, Ministries, JPI Urban Europe and other
- Introducing the field of urban planning to 6 generations of students of architecture
- Promotion of the multi-disciplinary Institute of Society and Space (SOCIS) as part of the Tampere3 process, including success in TUT RAE 2017
- Active role in preparatory work for the renewal of the Finnish Land Use and Building Act
- Chair of Jury of the National Housing Reform competition, [www.asuntoreformi2018.fi](http://www.asuntoreformi2018.fi)

Main positions of trust
- External Evaluator of the Spatial Planning programmes, Gengdan Institute, TU Beijing
- Board Member, Architecture Information Centre Finlan
- Member of the Editorial Board, The Finnish Journal of Urban Studies

Selected publications
Mission statement
As professor of transport transformation and adjunct professor of future transport I develop sustainable transport and logistics systems with the means of science in order to secure safe, healthy and just mobility for all.

Research interests
My current main research interest focuses on digitalization, automatization and electrification as drivers of change in everyday mobility. The aim of this research is to envision the transport system in 2050 and analyze the effects these driving forces have on the transport safety, emissions and transport poverty. Climate change mitigation policies in transport is also my main interest and I’ve carried out several studies outlining scenarios for low carbon transport and logistics and evaluating the cost efficiency on various decarbonisation measures. My scientific contributions include several articles in high-level journals such as Transport Policy, Technological forecasting and social change, Energy Policy and Research in Transportation Business and Management. I also serves as a reviewer regularly in high-level journals.

Top 5 achievements
• Leader of a Nordic research project on the future of energy efficiency and CO₂ emissions in freight transport which lead to several publications in top level journals.
• Leader of a research project studying digitalization, automatization and electrification as drivers of change in everyday mobility, funded by Kone Foundation.
• Affecting the Finnish climate policy in transport as the youngest member of the Finnish Climate Panel since 2014 and through two reports for the Finnish Climate panel studying the cost effectiveness of decarbonisation measures.
• Creator and chair of the 1st International Confeence on Mobility as a Service (ICoMaaS).
• Member of the team awarded shared 2nd prize in the Hiedanranta international architectural ideas competition in 2017.

Main positions of trust
Guest Editor, Themed Volume on Mobility as a Service, Research in Transportation Business and Management, 2018
Member of the Finnish Climate Panel since 2014
Member of the Board of the Finnish Road Association since 2018

Selected publications
Mission statement
To combine theory with practice. Simple things are beautiful. By understanding the true fundamentals, even complicated phenomena can often be modelled by rather simple assumptions.

Research interests
- Laboratory and field investigations methods, especially oedometer, triaxial tests, CPTU and field vane
- Behavior of soils, especially soft clays, material modelling, creep
- Development of calculation methods and programs, especially related to slope stability, settlements and earth pressure/retaining walls
- Safety and reliability of foundation structures, evolution of Eurocodes

Top 5 achievements
- Developments in stability calculation
- Development of Geocalc program
- Correction method for modulus number in settlement calculations for structured clays
- Simple model to evaluate yield surface of clays
- Evaluation of creep properties from VRS tests

Main positions of trust
Member of ISSMGE TC 205
Member of CEN TC250/SC7
Foreign secretary, FGS 2003-2013
Reviewer/editor for journals, books and conferences

Selected publications
- **Full-scale embankment failure test under simulated train loading.**
  Lehtonen, V., Länsivaara, T., Mansikkamäki, J. & Meehan, C. 2015 In : Geotechnique. 65, 12, p. 961-974 14 p
- **Two-dimensional slope stability analysis by limit equilibrium and strength reduction methods**
- **A study of the mechanical behavior of soft clay**
  Länsivaara, T. 1999 Trondheim: Norwegian University of Science and Technology. Department of Geotechnical Engineering.

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Funding
RASTAPA (Finnish Transport Agency)
FINCOME (Finnish Transport Agency)
EPSILON (Finnish Transport Agency)
Mission statement
My mission is to improve the fire safety of buildings, structures and materials through scientific research. The fire safety of built environment require new knowledge as new innovative construction materials, new technologies and new societal issues and objectives emerge and challenge the traditional fire design methods and solutions.

Research interests
• Advanced structural fire analysis and design methods, performance based design approach in particular
• Experimental and numerical research on fire performance of load bearing and partition structures
• Performance of steel hollow section joints in fire
• Fire safety of underground spaces
• Fire safety of chimneys and chimney penetration structures
• Digitalization of structural fire safety solutions
Our full scale laboratory equipment is making a major contribution to the study of how structures respond to fire and how to model and analyze the behaviour of structures in fire.

Top 5 achievements
• Development of the Quality Management System for fire testing activities at TUT and FINAS accreditation of the System in 2016.
• EU RFCS project STABFI, which studies the stabilization of steel buildings in fire conditions and includes demanding full scale fire tests carried out by TUT.
• Startup of structural engineering education in Univ. of Oulu and development of the curricula for master degree programme studies in structural engineering (2009-15).
• Qualification as a Chartered Member of the Institution of Structural Engineers in UK (MIStructE, CEng) in 2004, which is an international demonstration of personal achievement and professional competence.
• Academy of Finland funding for international mobility and training abroad, Fire research and testing, 2000-2001

Main positions of trust

Selected publications
• Leppänen P., Malaska M., Inha T. & Pentti M. 2017. Experimental study on fire safety of chimneys in real use and actual site conditions, Journal of Building Engineering. 14, p. 41-54
Mission statement

The mission is to develop new knowledge and capabilities on technology-based firms’ strategic transformation through projects, manufacturing innovations and servitization, and, thereby, promote their competitiveness in uncertain business environments. The focus is on industrial management research that has practical and theoretical relevance.

Research interests

Prof. Martinsuo’s primary research interests deal with the strategic transformation of technology-based firms: how firms organize and manage their processes, how they plan, decide and carry out strategic changes, and how they integrate and reorganize resources to develop and deliver customer-oriented offerings. Focus areas:

Project-based organizing and value-creation
- Extended project lifecycles and creating value through projects
- Multi-project management (management of programs and portfolios)
- Organizational integration of projects

Manufacturing innovations
- Process and front end of manufacturing innovations
- Manufacturing technology innovations and their supply chain effects – e.g. 3D printing
- Process innovations in manufacturing and services

Servitization of manufacturing
- Innovations in data-enabled industrial services and service business
- Standardization and productization of industrial and knowledge-intensive services
- Manufacturing firms’ service business transformation

Top 5 achievements

- Foundation and growth of TUT research on operations, projects and services (CROPS)
- Leading the planning of DIMECC’s Future Industrial Program (scope >30 MEUR, including 20 firms and 10 research teams)
- Best paper award e.g. in EURAM European Academy of Management Project Organizing track. Paper of the year award in Project Management Journal 2008
- Best reviewer of the Project Organizing track, EURAM European Academy of Management Conference 2017, Glasgow, U.K
- Best textbook of the year prize, Helsinki University of Technology, for the book “Project Business” (in Finnish, authors: Artto, Martinsuo & Kujala), 2006

Main positions of trust

Associate editor for International Journal of Project Management 2016 onwards Member of the editorial board 2012 onwards

Member of the editorial advisory board of International Journal of Managing Projects in Business 2011 onwards

EURAM European Academy of Management board, representative of Finland 2015-2018: Project organizing Special Interest Group board 2010-2014

Chair of Women’s Science Foundation 2017 onwards, Member of the board 2011 onwards.

Fellow in the European Academy for Industrial Management 2013 onwards.

Selected publications

Mission statement
I do teach and research in Supply Chain Management within commercial and nonprofit sectors. Understanding the real problems of society and organizations, and contributing to solve them through innovative academic methods and practices are my overall objectives.

Research interests
My working and research interest relates to Supply Chain Management, Operations and Marketing in Emerging Markets, Humanitarian Operations and Crisis Management, Healthcare Operations, and Sustainability. I use Empirical Research Methods (e.g. Survey, Experiment, Case Study), Modeling (e.g. System Dynamics, Optimization) in my projects.

Top 5 achievements
• Gyöngyi Kovács, Karen Spens, and Mohammad Moshtari (Eds) (2017), Palgrave Handbook of Humanitarian Logistics and Supply Chain Management, Palgrave Macmillan Publisher
• Early Career Postdoc Mobility Research Grant from Swiss National Science Foundation, 2014-2016
• Runner-up Award for Best Paper Award Competition at POMS’s College of Humanitarian Operations & Crisis Management, May 2014

Main positions of trust
Member of POMS (Production and Operations Management Society)
Member of EurOMA (European Operations Management Association)
Founder and Coordinator of Iranian Academy of Management and Economics in Europe

Selected publications
• Gyöngyi Kovács, Karen Spens, and Mohammad Moshtari (Eds) (2017), Palgrave Handbook of Humanitarian Logistics and Supply Chain Management, Palgrave Macmillan Publisher
• Moshtari, Mohammad. (2016). Inter-Organizational Fit, Relationship Management Capability, and Collaborative Performance within a Humanitarian Setting, Production and Operations Management, 1542–1557
Mission statement
My main mission is to develop practical knowledge and theories considering how organisations and individuals engage in innovative activities and employ technologies. I am passionately looking for novel perspectives on systemic phenomena that emerge as a result of these innovative activities.

Research interests
Saku’s research is in the intersection of technology and innovation management (TIM) and strategic management, and he does most of his work in close collaboration with industry. He is an expert in managing value creation, designing product strategies and competitive advantage. In his latest research he has been studying e.g. companies’ decision-making regarding innovation portfolio, science-based start-ups, and technology-based competition and collaboration in business and innovation ecosystems. He has published over 200 journal and conference articles, supervised 15 doctoral and over 150 MSc theses.

Top 5 achievements
- 2015 Scholarship in honor of “educating marketing-minded engineers” by Robit Rocktools Ltd and Vincit Oy
- 2014 Executive Educator of the Year, Edutech/Tampere University of Technology
- 2014 Best Paper Award – Runner Up “A View on Science-based Start-ups as Innovation Ecosystems” ICIMIT 2014
- 2011 University’s Master’s thesis supervisor award in recognition of excellence in supervision, Tampere University of Technology
- 2010 Emerald Literati Network, Outstanding Paper – award “Modest effect of national attributes and the role of cultural dimensions in technology adoption takeoff” (with Haapaniemi, T.)

Main positions of trust

Selected publications
- Dedehayir, O., Mäkinen, S.J. & Ortt, R., Roles during Innovation Ecosystem Genesis: A Literature Review, Technological Forecasting & Social Change (forthcoming)
- Saari, U., Baumgartner, R. J. & Mäkinen, S. J., 2017, Eco-Friendly Brands to Drive Sustainable Development, Sustainability, 9, 7
Mission statement
My mission is to be a link between construction industry and research and education in Tampere University of Technology.

Research interests
My work interests are business models in construction industry and processes in construction companies. No active own on-going research projects. Main focus is to help other professors to build research projects and collect funding from industry to them. Responsible also in several TUT – industry collaboration contracts.

Main positions of trust
Member of TUT Advisory Board
Member of TUT Tenure track committee
Member of several Finnish committees and organizations related build environment and construction industries.

Selected publications
• Threats and Opportunities with Customer Relationships in Construction Projects (Finnish), Helsinki University of Technology, 2005, ISBN 951-22-7932-0.
Mission statement
The mission is to understand and to assist practitioners in the utilization of information systems so that the systems could better support the employees, their work processes, and ultimately the organization.

Research interests
Pekkola’s research focuses on users in different manifestations of information systems, IS management and acquisition, and enterprise architecture, particularly how different processes are to be designed and implemented for maximum value creation. Lately his research has focused especially on the public sector and its transformation, caused by the ever growing phenomena of digitalization.

Methodologically Pekkola’s research is predominantly qualitative, with a small design science research twist.

His latest research projects have focused on
• information systems acquisition and the role of different stakeholders
• enterprise architecture implementation, institutionalization, and value creation
• developing work processes and activities
• data and information management

In practice, these topics are intertwined.

Top 5 achievements
• 130+ refereed scientific publications
• Raised external funding 1,8M€ for research since 2010
• Teacher of the year 2013 (Edutech, TUT)
• Columnist for ICT professionals (CIO.fi) 2012-2015
• Patent EP1999066008 1999

Main positions of trust
President of the Scandinavian Chapter of AIS (2017-2019)
Editorial board of Business and Information Systems Engineering (AE) and Scandinavian Journal of Information systems (advisory board member; EiC 2012)
Publication forum member (2014-2021)
Enterprise architecture professional community (KAOS): board member 2015-2017
Head of department at TUT and in University of Jyväskylä 10+ years

Selected publications
Mission statement
My mission is to promote sustainable renewal in the built environment by laboratory, faculty and university level activities, combining research, practical development and teaching in close co-operation with industry, other businesses and public sector.

Research interests

Top 5 achievements
• As a member of my research group I have taken part in generating and developing currently used condition investigation procedures and methods for e.g. concrete structures by means of research, practical solutions and written guidance, university education and continuing education.
• As Vice President and member of TUT:s executive group I took part in the process of reforming TUT into foundation based university.
• As the Head of Civil Engineering Department I have worked to improve our scientific and educational performance and results for the benefit of industry and society.
• Knight, First Class of the Order of the White Rose of Finland (SVR RI).

Main positions of trust
Member of the Board of Finnish Association of Civil Engineers (RIL), 2006–08
Member of the Board of Building Information Foundation (RTS), 2013-
Chairman of the Board of Concrete Association of Finland (BY), 2015-
Member of the Board of TUT Industrial Research Fund 2008–
Member of the Board of RYM Oy Built Environment Innovations, 2009–2011

ORCID: 0000-0000-0000-0000
TUTCRIS Portal
LinkedIn

Prof. Matti Pentti

Head of the Laboratory of Civil Engineering
Research Group Renovation and Life-Cycle Engineering

Research career
• Head of the Department of Civil Engineering 2005-2007, 2014-16
• Vice President, TUT, 2008-13
• Professor of Structural Engineering, 2002-
• Acting Assoc. Prof, Aalto University 1994
• Dr. Tech. 1999
• Lic. Tech. 1993
• M.Sc. 1981

Funding
Degradation of plastic floor coverings, Industry, 2017-19
Propagation of corrosion in weather exposed concrete structures in today’s climate, 2012-2015
Etc.

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Selected publications
• Corrosion products of carbonation induced corrosion in existing reinforced concrete facades, Kööliö, A., Honkanen, M., Lahdensivu, J., Vippola, M. & Pentti, M. 2015 : Cement and Concrete Research. 78, s. 200-207
• Pääkirjoittaja luvussa 3: Rakennerratkaisujen rakennusfysikaalinen toiminta, 2014 Rakennusfysikaalina suunnittelut ja tutkimukset, Vinha, J. (toim.). Helsinki: Suomen Rakennusinsinöörien liitto RIL ry, s. 89-189 101s. (RIL; nro 255-1)
Mission statement
I am passionate to find out how information systems impact societies and organizations at large. I am highly interested in IS adoption in organizational knowledge sharing. My work also aims to mitigate the unintended negative consequences of IS use, that is the Dark Side of IS.

Research interests
I am actively combining my research interests to project work and teaching.

RESEARCH:
My current Dark Side of IS research is focused on Technostress and IT addiction phenomena in organizational and leisure settings. On IS adoption front I look at globally distributed knowledge sharing (e.g. knowledge ownership, serendipity). I mostly apply quantitative methods (e.g. SEM) and survey research.

PROJECTS:
My current research projects (Erasmus+, company-funding) deal with social Augmented Reality (AR) and Blockchain technologies. These national and international projects cover both the bright and dark side of emerging information systems. We specifically look at AR in construction and real estate industries and Blockchain in education.

TEACHING:
I investigate these phenomena and emerging technologies with my students in “Software Business” and “Global Information Systems Management” courses at TUT.

Top 5 achievements
- I received a dissertation award from Ketky Ry and the dissertation was selected as the best thesis of 2014 from the IT faculty in Jyväskylä with excellent remarks.
- Best paper nomination (Dark Side of IS) at European Conference on Information Systems (ECIS) 2016, Istanbul, Turkey.
- Media presence: Selected to the shortlist of 100 future influential persons from Pirkanmaa (Aamulehti), appearances in major Finnish media (HS, Anna, Aamulehti, Keskisuomalainen, YLE radio).

Main positions of trust
Associate editor at European Conference on Information Systems (ECIS). Actively participating in editorial work in top-tier IS conferences and journals.

Selected publications
Mission statement
My mission in research and in teaching is to reach for a healthier, more sustainable, more beautiful and more enjoyable urban environment.

Research interests
My research interests are diverse – I’m a generalist rather than a specialist. My focus is on the problematic relationship between the Finnish zoning system and urban growth. I’m also interested in urban planning related power and governance issues as well as in healthy urban environment. Literary urban studies, especially utopias and dystopias, are also close to my heart. I speak for inter- and transdisciplinary research projects.

Top 5 achievements
• Chairman for Re-City 2015 and Re-City 2017 international city regeneration congresses.
• Task E leader and member of steering committee in ADELE-project (Autoimmune Defense and Living Environment, TEKES Strategic Research Opening) 2015-2018.
• Sibbesborg: International Competition for Sustainable Community Development, 3rd prize (together with architect Jouko Kunnas), 2012 (30 entries)
• Masterplan for Henna, a new ecological Finnish town of 14 000 inhabitants (together with architect Jouko Kunnas), 2011.
• The Innovative Town Concept for the Future, international competition, shared 1st prize (together with architect Jouko Kunnas), 2010 (72 entries).

Main positions of trust
Member of Entrance Examination Committee in Architecture 2015-
Member of the Finnish Association of Architects SAFA
Registered Urban Planner, FISE, YKS 133
Kaupunginosayhdistys Skata ry, Chairman 2010-2014

Selected publications
• Rajaniemi, Juho (2018) : "Epätoivon kaupungit ja perirealistinen dystopia" in Futura. 36, 4, pp. 19-27
• Rajaniemi, Juho (ed.) (2016): Re-City: Future City – Combining Disciplines, Datutop Series 34, Tampere University of Technology, School of Architecture, Tampere
Mission statement
My mission is to develop a process and management system that emphasizes responsibility in the construction and real estate sectors.

Research interests
My studies are focused on the following areas: Construction project management and contracting, Demanding building renovation projects, Lean, Continuous flow in construction, Responsible construction, Land use efficiency.

Top 5 achievements
• The Golden Mark of Honour of the Finnish Association of Civil Engineers RIL, 2007
• Outstanding Paper Award Winner at the Literati Network Awards for Excellence 2010: An article “Leena Aalto & Arto Saari: Re-engineering of the meal logistics in a sheltered house for elderly people” published in Facilities was selected as it was one of the most impressive pieces of work the editorial team has seen throughout 2009;
• 31 articles in journals ranked in Web of Science; h-index 12
• Supervised over 150 Master’s theses and 10 doctoral theses
• Trainer in Construction Project Management Continuing Education Programs RAP/RAPS, 2003-

Main positions of trust
Finnish Building Classification System, Working Committee, 2011-
Construction Management Education Program (RAP/RAPS), 3L Education, Member of the steering group, 2016-

Selected publications
Mission statement
I am interested in searching and learning new things and teaching them to others. I am particularly eager to understand how to make a good use of business opportunities enabled by technological development.

Research interests
My research interests are broadly in the field of industrial management. Research approaches combine qualitative and quantitative approaches, lately more often using big and wide data sets (e.g. machine learning). One of the recurring themes is to investigate how value is created and captured in emerging business ecosystems. Further, business concept development and innovation management are close to my heart. Recently, I have been actively involved in the new bio- and circular economy business area (www.eco3.fi) which is an exemplary case of how to develop an industrial scale demonstration and pilot opportunities for industry and research. This case illustrates how to combine examinations of how platform-based competition evolves in business ecosystems and how new valuable offerings should be developed. My long-term focus area has been innovation management in business networks, especially the question of how the commercialization phase of an innovation should be implemented.

Top 5 achievements
• Research awards Solution Excellence Award by TeleManagement Forum in 2011, Best Paper Awards in ICSOB2015 and Mindtrek2014
• Teaching awards Educator Award of the Year 2017 from Edutech (TUT)
• Chair and organizer of several conferences, including the European Conference on Management of Technology (EuroMOT), Tampere 2011
• Co-creator of the international best-seller book Business Model Generation

Main positions of trust
Guest Editor of the Journal of Product Innovation Management in 2014; the International Journal of Business and Systems Research in 2017
Member of the Editorial Board of the International Journal of Business and Systems Research 2009-2017
Number of positions on Scientific Panels and Steering Groups
Founding member of ISPIM Special Interest Group Platforms and Ecosystems
Head of education programs in Edutech, e.g. Executive MBA in Business Renewal

Selected publications

Contact information
Tampere University of Technology
The Laboratory of Industrial and Information Management
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Mission statement
My mission is to support university stakeholders to make better strategic choices today
• by understanding the future changes in technology, economy, society and behavior of individuals with different foresight methods
• by learning with experimentation
• by doing with co-creation mindset in external networks

Research interests
My research interest is broadly in the future studies and strategic management and in particular in the:
• Technology and business foresight
• Industry evolution
• Digital transformation (platform, network, sharing and outcome economy)
• Business models
• Competitiveness
• Co-creation, open innovation

Top 5 achievements
My achievements are related to my 30 year industrial career in senior management of a global engineering corporation, and apart of ordinary performance related, achievements are such nature as:
• Large successful acquisitions or mergers
• Major market, production or technology investments
• Strategic or operational change management programs
• Contribution to development of Industry-Academia platform FIMECC Oy

Main positions of trust
Board member, Centennial Foundation, Technology Industries of Finland Council member, Finnish Cultural Foundation / Pirkanmaa Honorary Consul in Pirkanmaa, The Republic of Poland Vice Chairman, new business council, Tampere Chamber of Commerce Chairmanship and board memberships in companies

Selected publications
• Sommarberg, M. Mäkinen S. (2017), Mechanisms of disruptive technological change: Case studies in transformation of traditional industries, Proceedings of Portland International Conference in Management and Engineering (PICMET), IEEE
Mission statement

My mission is to improve design and construction methods and techniques so that we can build moisture safe, energy efficient, environmentally friendly and long-life buildings, which fulfill also all other essential objects of high-performance buildings in Finland.

Research interests

We analyse building physical performance of structures and whole buildings in many different ways. Main drivers for these researches are moisture and mould problems of buildings, energy efficiency and climate change. Our target is comprehensive research, which takes into account all important factors.

Main research topics are:

- Hygrothermal performance of building envelope structures and whole buildings
- Building physical material properties
- Indoor and outdoor air conditions, climate change
- Building physical performance criteria and acceptable limit values, reliability
- Development of analysis method for moisture performance of envelope structures
- Energy consumption and energy efficiency of buildings

We have focused also to the development of building physical research methods and facilities. Our main research methods are calculational modeling, laboratory tests (including material tests and structural tests) and field tests (including experimental buildings and real buildings).

Top 5 achievements

- Over 200 scientific publications and 200 research projects related to building physics
- Development of analysis method for moisture performance of envelope structures and building physical test years in present and future climate
- Development of Finnish mould growth model together with VTT, Finland
- Founder, organiser and chairman at five Finnish Building Physics Conferences since 2007, and chairman of jury of Finnish Moisture Safe Construction Award three times since 2013
- Chief editor and principal author of the Finnish building physics handbook 2014

Main positions of trust

Member of Union Council of Finnish Union of University Professors, 2017–
Member of Editorial Board for Journal of Building Physics, 2011–2013
Member of scientific committee at 10 international scientific conferences, 2008–
Chairman of Committee for Building Physics at Finnish Association of Civil Engineers RIL, 2006–
Representative of Finland at three international IEA EBC Annex projects (41, 55 and 83), 2003–2016
External evaluator of building physics in challenging construction projects and building trade legal cases in Finland 2006–

Selected publications

Faculty of Computing and Electrical Engineering

Mission Statement

Pursuing excellence, The Faculty of Computing and Electrical Engineering is an international, diverse and multidisciplinary community of researchers and students. The topical research covers the essential ingredients of building the future digital society with solutions that are groundbreaking and designed understanding the human needs. The outcome of the basic research in software design and systems, signal processing, communications engineering and networking, computer science, electrical engineering, and power engineering finds its applications in many forefronts of society, ICT, industrial intelligent machines, healthcare, consumer solutions and so forth. We are ready to look beyond the obvious next step.
Mission statement
I'm leading the EffProc research team that studies efficient implementation of computationally demanding algorithms for, e.g., signal processing. The research area is nowadays of high importance as it addresses for example the problem of deploying deep learning–based algorithms to very small, battery powered devices.

Research interests
- Parallel processing
- Model-based design
- Models of Computation
- Algorithm-to-Architecture Optimization

Top 5 achievements
- Research grant: Academy of Finland, Academy Project CoEfNet, 2017
- Research Grant: Academy of Finland, Post-Doctoral grant, UNICODE, 2015 IEEE SIPS, best paper award, 2007

Main positions of trust

Selected publications
Mission statement
The Cryptography Group I lead is part of the Network and Information Security (NISEC) Group at TUT, active since 1996. Our research lies at the intersection of theory and practice in cryptography and security. We specialize in practical, real-world attacks that exploit implementation weaknesses in deployed software and hardware to recover security-critical information. We do not abstract layers away. If you have ever followed an HTTPS link in your browser and/or seen a padlock in your browser’s address bar, it is likely you have passed through a code path that we first exploited, then patched.

Research interests
• Cryptography
• Side-Channel Analysis (SCA)
• Security
• Embedded systems
• Computer architecture

Top 5 achievements
• 13 US patents pending
• DSA 3773: ECDSA P-256 timing attack key recovery
• CVE-2016-2178: OpenSSL DSA follows a non-constant time codepath for certain operations
• CERT-SE SR11-226: OpenSSL 0.9.8g (32-bit builds) bug leaks ECC private keys
• CERT-US VU536044: OpenSSL leaks ECDSA private key through a remote timing attack

Main positions of trust
Member, Young Academy Finland, Finnish Academy of Science and Letters, 2017–
Editorial Board Member, Trans. Cryptographic Hardware and Embedded Systems, 2017–
Steering Committee Member, NordSec: Nordic Conference on Secure IT Systems, 2016–
Member, Academy Club for Young Scientists, Finnish Academy of Science and Letters, 2016–2017

Selected publications
• B. Brumley and N. Tuveri. Remote timing attacks are still practical. ESORICS 2011, LNCS 6879.
Mission statement
I am a researcher and academic entrepreneur, interested in scientific imaging theory and applications, particularly in imaging algorithms development and system design. I believe that a crossroad of academic and entrepreneurial activities provides a great benefit and a real impact on a society.

Research interests
• Image and video processing algorithms design and implementation,
• inverse imaging algorithms,
• multimedia,
• pattern recognition and machine learning,
• image and video compression,
• lensless camera systems and digital holography.

Top 5 achievements
• IEEE Fellow, 2018
• Honorary Doctor of Science, Don State Technical University (DSTU), Rostov-Don, Russia, 2015
• Largest number of citations among all TUT researchers, according to Google Scholar
• Publication [1] in the selected publications list, is in the list of most popular documents of IEEE Transactions of Image Processing, and one of the most cited papers in that journal
• IS&T Service Award, 2014

Main positions of trust
Editor-in-Chief, Journal of Electronic Imaging, SPIE and IS&T (since 2016)
Associate Editor, IEEE Transactions on Image Processing (2015–2016)
SPIE/IS&T Electronic Imaging Symposium, IPAS Conference Chair, 2002–2018)
EuMA Radar Prize (2011)
Member, Technical Committee on DSP, IEEE Circuits and Systems Society
Chairman, IEEE Finland Section, 2001–2002
CEO and Co-founder, Noiseless Imaging Oy, TUT spinoff company, 2011

Selected publications
Mission statement
Our research analyzes and develops new well-founded algorithms for machine learning, data mining, and artificial intelligence. We want to understand the fundamental reasons why and when do these algorithms perform well and to what application situations do they fit. We also participate in the use of modern data analysis to application fields.

Research interests
- Artificial Intelligence methods and techniques
- Supervised machine learning
- Unsupervised machine learning
- Reinforcement learning
- Data mining
- Knowledge discovery
- Data streams
- Pattern recognition
- Design and analysis of algorithms
- Theoretical computer science
- Approximation algorithms
- Randomized algorithms

Top 5 achievements
- The excellent Ph.D.'s I have had the pleasure to supervise all of which have brought significant contributions to science. The same applies to on-going projects.
- I have been the editor of five (international) books and two journal special issues.
- Our research is in the forefront of scholarly knowledge. The longest running project has developed the theory and practice of optimal discretization of numerical attributes in classification learning. We have further developed these methods to apply to new learning/mining settings.
- Internationally recognized (senior) expert with many duties and responsibilities.

Main positions of trust
Editor of journal *Machine Learning*, Editorial Board Member in three other journals
Guest Editorial Board member of *Data Mining and Knowledge Discovery*
PC co-chair of four conferences (ECML’02, PKDD’02, ISMIS’09, DS’11)
Area/Vice Chair / Senior PC member in several first-tier conferences

Selected publications
Research career

- Assoc. Professor (tenure track) 2015–
- Academy of Finland Research Fellow 2011–2016
- Academy of Finland Post Doctoral Researcher 2009–2011
- DscTech Signal Processing 2007
- PhD Applied Mathematics 2005

Funding

- Academy of Finland, EU H2020

Mission statement

Develop theoretically grounded models, methods, and regularization priors for unsupervised processing of data from a diverse range of sensors, including direct, inverse, as well as computational imaging systems, with the ultimate goal of substantially improving the sensing/imaging quality and extending the applicability and efficiency of these devices.

Research interests

Core expertise: Characterization, transformation, and filtering of noise and other degradations for a variety of consumer, medical, and scientific imaging devices.

Applications of special interest: Photon-limited imaging, magnetic resonance imaging, LWIR thermography (microbolometer), reconstruction from incomplete (sparse) measurements such as limited-angle tomography, as well as cross-modal reconstruction from heterogeneous sensor arrays.

- Noise modeling and imaging sensor profiling
- Optimal transformations for variance stabilization
- Correlated, structured, and fixed-pattern noise
- Signal and multidimensional image filtering
- Spatially adaptive (anisotropic, nonlocal) methods
- Optimal co-design of image acquisition and restoration
- Parallels between modern image filtering and human visual system

Top 5 achievements

- State-of-the-art high-impact contributions in the field of noise analysis, transformation, and filtering
- 5 “Highly Cited Papers” in the top 1% of the field (Web of Science)
- 8000+ citations, H-index 32 (Google Scholar), 3000+ citations H-index 18 (WoS)
- Outstanding Editorial Board Member Award, IEEE Transactions on Image Processing
- Author/co-author/ supervisor of several award winning publications (EUSIPCO Best Paper Award, IEEE SPS Young Author Best Paper Award, Best Finnish Ph.D. Thesis in the Field of Pattern Recognition, ISBI First Prize in Fetal US Biometry Challenge)

Main positions of trust

- Panelist, Finnish Publication Forum (Julkaisufoorumi)
- Member of the Image, Video, Multidimensional Signal Processing Technical Committee (IVMSP TC) of the IEEE Signal Processing Society, chairing the Area Chair and Reviewer Coordination Subcommittee
- External Expert Evaluator for the Israel Science Foundation, Swiss National Science Foundation, Italian Research and University Evaluation Agency (ANVUR), and the Romanian National Research Council (CNCS)

Selected publications

Faculty of Computing and Electrical Engineering

Mission statement
My main mission is to develop theories, algorithms and applications and train researchers in data science and engineering, particularly in machine learning and artificial intelligence.

Research interests
Dr. Gabbouj’s research interests include Big Data analytics, multimedia content-based analysis, indexing and retrieval, artificial intelligence, machine learning, pattern recognition, nonlinear signal and image processing and analysis, voice conversion, and video processing and coding. He published three books and over 700 journal and conference papers and supervised 45 doctoral and 58 Master theses.

Top 5 achievements
• 2017 Finnish Cultural Foundation for Art and Science Award
• Conferer of Degrees (Promootori) at the Ceremonial Conferment of Doctoral Degrees at TUT, 2017
• Academy of Finland Professor, 2011–2015
• IEEE Fellow, 2011
• TUT Foundation Recognition Award, 2015

Main positions of trust
EURASIP Advisory Committee, since 2012
General co-Chair of IEEE International Conference on Image Processing, 2020
Director, NSF Center for Visual and Decision Informatics, Finland
Site Distinguished Lecturer, IEEE DLP of the CAS society, 2004–2005
Chairman, IEEE Finland Section, 2002–2003; Executive Committee member, 2004–2005
Chairman, IEEE Signal Processing and Circuits and Systems, Finland Chapter, 02–04
Member, Editorial Board of Signal, Image and Video Processing, Springer
Associate Editor, IEEE Transactions on Image Processing, 1994–1998
Member, Editorial Board of EURASIP Book Series on Signal Processing and Communications
Guest Editor, the European Journal Signal Processing, August 1994.

Selected publications
Mission statement
My mission is to enable new immersive and interactive visual technologies through advanced signal processing research and to train talented and creative students in the related scientific disciplines.

Research interests
I am primarily interested in Plenoptics, the theory of the light field and its processing, since it provides the foundations for developing future imaging systems aimed at recreating the visual world realistically and augmenting human perceptual, creative, and cognitive capabilities. I structure my research interests in three sectors: 3D visual scene sensing (multi-camera and multi-sensor setups, usually working in low-sensing mode); light field processing (multi-view – multi-depth processing, new spectral representations such as shearlets, Fourier optics modeling of plenoptic imaging systems) and immersive displays (modeling and profiling 3D and light field displays, maintaining continuous parallax and focus cues on super-multiview displays).

Top 5 achievements
• Coordinator of the Marie Curie ITN ‘Immersive Visual Technologies for Safety-critical Applications’ (https://immersafe-itn.eu)
• Coordinator of the European Training Network on Full-parallax Imaging (http://www.full-parallax-imaging.eu)
• Director of the research infrastructure facility ‘Centre of Immersive Visual Technologies’ (http://www.tut.fi/civit)
• State of the art in densely-sampled light field reconstruction: published in TPAMI and JSTSP, and publicized in grand challenge at IEEE ICME 2018
• A few patents and patent applications in the area of 3D visual scene sensing (https://patents.justia.com/inventor/atanas-gotchev)

Main positions of trust
Associate Editor: Journal of Electronic Imaging, 2017-2019
Reviewer for EU REA grants
Member of SPIE, OSA and IEEE (Seasonal schools program committee, 2016-2018)
Chair of the 3DTV series of conferences (2009 – 2018)

Selected publications
• Bregovic, R, Kovács, P and Gotchev, A 2016, ‘Optimization of light field display-camera configuration based on display properties in spectral domain’ in Optics Express
Mission statement

Professor Hamari and his team are on a quest to understand how technology affects us, how we affect technology and how technology can be molded to shape our reality to increase the flourishing, productivity and overall happiness of mankind.

Research interests

Dr. Hamari’s and his research group’s (Gamification Group) research covers several forms of information technologies such as games, motivational information systems (e.g. gamification, game-based learning, persuasive technologies), new media (social networking services, online video streaming, eSports), peer-to-peer economies (sharing economy, collaborative consumption, crowdsourcing), and virtual economies. Dr. Hamari has authored several seminal empirical, theoretical and meta-analytical scholarly articles on these topics from perspective of consumer behavior, human-computer interaction, game studies and information systems science. His research has been published in a variety of prestigious venues such as Organization Studies (J3), Journal of the Association for Information Science and Technology (J3), User Modeling and User-Adapted Interaction (J3), International Journal of Human-computer Studies (J3), Information & Software Technology (J3), Journal of Documentation (J3), International Journal of Information Management (J2), Computers in Human Behavior (J2), Internet Research (J2), Cyberpsychology, Behavior and Social Networking, Electronic Commerce Research and Applications, Simulation & Gaming as well as in books published by e.g. MIT Press (J3).

Top achievements

- First Professorship in Gamification internationally
- Over 6000 citations, h-index: 27, i10-index: 40 (Mar 2018)
- Information Systems Science Scholar of the Year (Finland) 2017
- Article among the “most notable articles in computer science” (ACM)
- Honorary Distinguished Alumnus of Kangasala High School
- Emerging Virtual Scholar (AERA)

Main positions of trust

Founding member and board member of The Finnish Society for Game Research
Member of the Publication Forum (JUFO) Computer and information science science panel
Chair of the Gamification track @ Annual Hawaii International Conference on System Sciences (HICSS) and The International GamiFIN conference

Gamification Group

GL! HF! . . . GG!

Selected publications

Mission statement

I’m leading the TUT Machine Learning Group of 10 people. The mission of the group is to deploy modern machine learning and deep learning technologies to everyday industrial use. We study practical implementations on low resource platforms, for example, deployment of state-of-the-art object detection models to working machines.

Research interests

- Deep Learning
- Machine Learning Implementations
- End-to-End Learning
- Object Detection from Camera Stream
- Optical Character Recognition

Top achievements

- ICANN MEG Mind Reading Challenge, 2011: Winner
- DREAM6 Molecular Classification of AML Challenge, 2011: Best performer
- IEEE MLSP 2012 Amazon Data Science Challenge: Second Place
- IEEE MLSP 2013 Birds Challenge: Top 10% [Kaggle]
- DecMeg2014 – Decoding the Human Brain: 2nd (of 269) [Kaggle]
- Glaston Hackathon 2017: Winner

Main positions of trust

- Member, TUT Academic Board, 2013–
- Member, Board of Directors, Visy Oy

Research career

- Assoc. Prof TUT 2017–
- Lecturer TUT 2005–2017
- Visiting researcher Niigata Univ. Japan 2010
- Partner Visy Oy 2003–
- Research Scientist Visy Oy 2004–
- Dr.Tech TUT 1999

Funding

Academy of Finland Project CoefNet, 2017–2021
Tekes Project Citytrack, 2017–2018

Contact information

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Assoc. Prof.
Heikki Huttunen

ORCID: 0000-0002-6571-0797
TUTCRIS Portal, LinkedIn, Website

Associate Professor at Signal Processing Lab. Head of the Machine Learning Group.

Real-time object detection and tracking deployed in a container terminal.
Mission statement
My mission is to study and teach how to do profit with software products and services in the ever-evolving business world. The mission requires a wide understanding of issues and fields related to the production, marketing and even management of software products and services.

Research interests
A common theme characterizing my research interests is software: I have studied software and its production from various viewpoints. Roughly, the research areas, I have addressed, range from agile software development practices to revenue models in software ecosystems; and from securing software against attacks to studying impacts of customer reviews to the sale of software products. Researchers approaches used combine both qualitative and quantitative methods.

The themes that I have recently addressed in my research include, e.g.:
- Influence of multi-homing in software platform competition,
- Ecosystem health, well-being and evolution,
- Secure software engineering with Agile development methods, and
- Hardening software with diversification and obfuscation methods.

Top 5 achievements
- More than 70 supervised Master's and Bachelor’s theses as well as two instructed dissertations for three universities.
- Over 100 peer-reviewed publications ranging from software engineering processes to software business revenue models and from software security techniques to analyses of ethical questions related to various areas of digitalization.
- Published in leading journals of the software engineering field, such as Journal of Systems and Software and Information Systems and Technologies.
- Five best paper and one best student paper awards from various international conferences as well as the Master’s thesis prize.
- A member of the recipient group of Turku Chamber of Commerce’s ICT Act of Year 2012 prize for Windows Phone Hackathon.

Main positions of trust
Number of positions in program committees of scientific conferences; e.g., International Conference of Agile Software Development, International Conference of Software Business and International Workshop on Software Startups.
Chair of the organizing committee of International Workshop on Software Ecosystems (2017) as well as member of several program committees.

Selected publications
Mission statement
Model based system design methods and tools that automate the generation and configuration of HW and SW on multicore + FPGA platforms. The main application area is video. Experience also on wireless sensor networks and neural networks.

Research interests
• High Level Synthesis
• IP-XACT/IEEE1685
• FPGA accelerated cloud architectures and services
• System-on-Chip and Network on chip architectures
• Parallel video encoding implementations
• Neural Network and Genetic Algorithm implementations on FPGA

Top 5 achievements
• Kactus2 open source tool framework for System-on-Chip design
• Kvazaar open soucre HEVC video encoder
• Methods and arrangements for realising betting with off-line terminals, US Patent 7543152
• Founder of spin-off company Wirepas

Main positions of trust
Member of IEEE, Computer Society, Signal Processing Society
Program committee member e.g. in DATE, Embedded Computer Systems - Architectures, MOdeling, and Simulation (SAMOS)

Selected publications
Asst. Prof. David Hästbacka

ORCID: 0000-0001-8442-1248
TUTCRIS Portal, LinkedIn, Twitter

Assistant Professor (tenure track) in Software Engineering, Laboratory of Pervasive Computing

Research career
- Assistant Professor, TUT, 2018–
- Academy Postdoctoral Researcher, TUT, 2017–
- Postdoc Researcher, TUT, 2013–2017
- D.Sc. (Tech.), TUT, Faculty of Engineering Sciences 2013
- Teaching Associate, TUT, 2012–2015
- Researcher, TUT, 2007–2012

Funding
Academy of Finland, Postdoctoral Research Grant SEMIS, 2017–2020
ECSEL Productive4.0, 2017–2020
H2020 COCOP, 2016–2020
Tekes Urban Smart Energy, 2017–2019

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Mission statement
Software engineering applied to industrial automation, production settings and other smart environments. Leading a research group with focus on cyber-physical systems, IoT enabling technologies and system integration for more autonomous and adaptable software based systems.

Research interests
Software based systems in production environments as well as other smart environments such as cities and buildings
- Software architecture and communication for large-scale distributed processes
- Platforms and ecosystem frameworks increasing interoperability and development of new data-driven solutions
- Information models and semantics for autonomous composition of functional services and data-based services
- Combining models of the physical world with software models for self-awareness based adaptability
- Development of models and analytics facilitating development of dependable systems

Top 5 achievements
- Long and successful research collaboration with industry partners
- Academy of Finland Postdoctoral Researcher grant SEMIS, focusing on the ambitious topic on semantic interoperability of industrial systems, 2017
- Preparing and receiving funding for the TUT coordinated H2020 project COCOP together with Prof. Matti Vilko (PI), 2016

Main positions of trust
Finnish Society of Automation: Finnish MES Forum, OPC Forum. TTHH Association of Decentralized Information Management for Industry, member of working committee. TPC member: IEEE Int. Conf. on Industrial Informatics, IEEE Int. Conf. on Emerging Technologies and Factory Automation, Int. Conf. on Enterprise Information Systems.

Selected publications
Mission statement
Culture collide. Software engineering (SE) is team work. Currently teams are geographically distributed and the members represent cultural backgrounds. The software artefacts are widely, often openly, available and developed for multicultural user base. In software development it is important to understand cultural differences, to adapt the work practices and artefact features to take into account differences in national, organizational and user cultures – to avoid collisions.

Research interests
My researcher career covers the period from 1974 to present. During the decades the focus is changed; even the old topics have followed me as a part of my researcher. My research gamut covers information modelling, knowledge engineering, AI, technology management (forecasting and trend analysis), ubiquity and context sensitivity in information society. The last decades has focused the work in software process improvement (SPI) especially in small and very small (software development) entities (VSE), first based on process oriented (CMMI, ISO 15504 based) development, gradually transferred towards the problems of global software business. Currently developments teams are globally distributed, multicultural and develop artefacts for global multicultural markets. I’m trying to find answer to the question “How to do successful SE in this environment”, SE may include elements of social networking and crowdsourcing. Multicultural loosely connected teams of experts – common e.g. in open source software development - have become a part of normal software business, too. It requires new management skills and practices to organize the work in this strongly culture sensitive environment. The answer to the research question (my research) covers elements of human behavior, software processes and software architectures combined with culture knowledge (culture sensitivity).

Top 5 achievements
Honors:
• 2014−2017 Research Professor, Grants
• 2014 Teacher of the Year (Vuoden opetusteko).
• 2012 Researcher of the Year (Vuoden tutkija),
• 2003 Annual influential person of the year : Vuoden tietotekniikkavaikutta. Finnish Data Processing Association (Tietotekniikan liitto; 2003)
• Several Academic grants and memberships in scientific and societal boards

Main positions of trust
Continuing duties in conference committees (Chairman, PC member): EJC, ADBIS, MIPRO, PICMET, CompSysTech, MIPRO, Sofsem, SQAMIA, Baltic IS & DB
Academic director of Pori eMBA I-VI programs; Six eMBA Programs in 2003−2017

Selected publications
These papers build the basement of my work in the area of multicultural software engineering. Wide variety of aspects in the topic are covered by my recent work.
Mission statement
I am aiming to work to do my duties for mitigating the climate change by research and educational activities relating to the development of Smart Grids which is a tool for increasing the penetration of renewables. Smart Grids is an enabler of energy-efficient and environmentally friendly open energy market and at the same time the critical infrastructure of society.

Research interests
The key research areas are as follows:
- Distribution automation, active network management, and microgrids
- Smart Metering, Demand Response, active customers, and customer load modeling
- Electric vehicles, battery energy storages, and their network impacts
- Application of ICT in Smart Grids
- Power quality management
- Electricity market, new business models, power-based grid tariffs, and network business regulation issues

Top 5 achievements
- Over 180 supervised diploma theses and 10 supervised doctoral theses
- Over 30 refereed articles in international journals and over 200 publications in international conferences
- Järventausta P., Smart grids with large scale implementation of Automatic Meter Reading - Experiences from Finland. A chapter in international text-book “Handbook of Clean Energy Systems”: Published by John Wiley & Sons, Ltd., 2015
- Active co-operation with industry, various stakeholders and other research partners in several research projects and in other activities
- Taking part for global commercialising the distribution management system at Versoft Oy and ABB Transmit Oy, which basis lies on the basic research work at TUT in 90's

Main positions of trust
Member of the working group of smart grids established by the Ministry of Economic Affairs and Employment in 2016–2018
Member of board of Cleen Oy in 2013–2015 and deputy member in 2011–2013
Member of the SMARTGREENS conference Program Committee in 2013–2017
Member of evaluation committee of the Swedish Centre of Excellence in Electric Power Engineering (EKC2) at The Royal Institute of Technology (KTH) in 2013
Member of the advisory board of Grid4EU-project (7th framework program) 2011–2015
Member of working group of the European Technology Platform for Electricity Networks of the Future (ETP-SmartGrids) 2005–2008

Selected publications
Mission statement
I do what I am always been interested in: learning and finding new things and then teaching them to the others.

Research interests
Software testing and architectures. How to apply artificial intelligence on these areas? Action-oriented solutions for concurrency. Change of execution paradigm to better support programming of concurrent and distributed systems. Educational software. How to use software in education and how to educate software skills on different levels? Ethical consequences of software usage.

Top 5 achievements
• Medal of the Student Union of TUT given on educational merits.
• Member of a team winning European Championship on Micromouse (a robot challenge).
• First publication in the publication list is somewhat a "standard" reference if problems of learning in programming are discussed.
• Quite a number of examined Master’s theses (over 250)
• President of the council of the Finnish Association of Graduate Engineers (TEK).

Main positions of trust
Member of the SEFI Board of Directors (European Society for Engineering Education.
Member of Administrative Council of Kaleva (Insurance company).
President the Board of Ulla Tuominen’s Foundation.
President of Koovee Ry (a sports club with 4000 members)

Selected publications
Mission statement
My goal is to develop control methods that maximize the effectiveness of the power electronic system – or equivalently – that fully utilize the capability of the available hardware.

Research interests
My research interests lie at the intersection of power electronics, optimal control and optimization. More specifically, I am interested in electrical drives, grid-connected converters, hybrid systems, model predictive control and mathematical programming.

Regarding the power electronics, I am interested in control and modulation algorithms for low and high power converters, such as low- and medium-voltage drives and multilevel converters. The main objective is to develop methods that during steady-state operation produce low distortions per switching frequency (or switching losses). Moreover, the controllers should lead to very short settling times during transients, limited only by the physical constraints of the system.

On the control side, my focus is on model predictive control (MPC), hybrid systems and the underlying mathematical optimization problems. The goal is to devise techniques that alleviate the (real-time) computational burden of MPC. The ultimate goal is to implement the developed algorithms on a control platform, such as a digital signal processor (DSP) or a field-programmable gate array (FPGA).

Top 5 achievements
- 41 publications (h-index: 13)
- One patent filing
- Third best paper award, IEEE Transactions on Industry Applications
- First prize paper award, Industrial Drives Committee of the IEEE Industry Applications Society
- Scholarships from Greece (ICCS) and Germany (DAAD)

Main positions of trust
IEEE Member (PELS, IAS, IES, CSS)
Member of the Technical Chamber of Greece

Selected publications
Mission statement
Dr. Lempiäinen targets to find new revolutionary solutions / applications for mobile communications technology field. Examples of this kind of targets are:
• Ultimate need of national emergency mobile network in commercial frequencies for all inhabitants in Finland (inc. also authorities)
• Single Path Single Access = unique frequency reuse at each terminal location
• Passive geothermal cooling for base station sites (saving energy)
• User/Customer guided energy and capacity optimization in mobile networks (inc. operators’ loyalty program = dialogue between operators and users)

Research interests
Dr. Lempiäinen’s research interest includes different aspects of evolution of mobile communications. The evolution understanding contains several system level areas as deep technical details (e.g. need of antenna development) as knowledge of technoeconomical approaches as definition of indoor/outdoor service scenarios in multi-technology environment (e.g. 5G vs. WiFi). Dr. Lempiäinen has published two international books, four book chapters/sections, 94 journal and conference papers, and supervised 9 doctoral and 43 Master theses.

Top 5 achievements
• Initiating national discussion and demand to have emergency mobile network in commercial frequencies for all inhabitants in Finland (social impact)
• Analysis and theory (business plan) about future of mobile networks
• Innovating Single Path Single Access (SPSA = needle beams) concept to bring unique improvement in frequency efficiency in mobile communications
• Founder of four private start-up companies: European Communications Engineering (1998), Geofridge (2012), Greatest Heroes (2013), ShipMyPacket/Agora Networks (2016)
• The Best Paper Prize at the IEEE IC-BNMT2010 conference, China, 2010.

Main positions of trust
Member of Technical Committee, 5G Forum, 2018
Member of Technical Committee, AfricaCom 2015
URSI National Board Member, 2003–
Chairman, European Communications Engineering Ltd, 1998–
Mission statement
My mission is to apply state-of-the-art signal processing and machine learning methods and tools to real-world problems and to solve problems encountered in industry, public organizations or society in general by means of these methods and tools. I also strive to increase the level of awareness in students and citizens about the possibilities created by artificial intelligence.

Research interests
My research has spanned various application areas of machine learning techniques including crop yield prediction based on agricultural Big Data, analysis of remote sensing data for vegetation mapping, biosphere modelling for safety assessment of spent nuclear fuel disposal and analysis of polygraphic biosignal recordings for patient monitoring. Previously I have studied and developed methods for estimating signal entropy/complexity applying them to physiological data. Recently my main interest has been in combining detection of synchronization patterns in multichannel data with network analysis and machine learning techniques to provide decision support in intensive care. Concerning agricultural Big Data analysis our research group is developing deep learning algorithms combining CNN and LSTM networks for crop yield prediction and modelling.

Top 5 achievements
• Development of methods and models for brain function monitoring in anesthesia and intensive care with several papers published in Anesthesiology, NeuroImage and IEEE Transactions on Biomedical Engineering.
• Development of methodology for biosphere assessment and landscape / land uplift modelling. The work has been published in several journal papers, several Work Reports of Posiva Oy and in three doctoral thesis.
• Leadership positions in academia (Head of department in TUT and Tallinn TU; vice director of UCPori).
• Development of a study module for experts in healthcare analytics together with Tallinn University of Technology and Satakunta Univ. of Applied Sciences.
• Supervision of 5 doctoral thesis and over 40 Master's thesis.

Main positions of trust
IEEE, Senior Member
IFMBE, Member
Associate Editor for IEEE Transactions on Information Technology in Biomedicine
Evaluator of Horizon2020 FET OPEN RIA calls 2015/1 and 2015/2
Chair of the Scientific Board of Pori University Consortium

Selected publications
Faculty of Computing and Electrical Engineering

**Mission statement**
To develop low-cost privacy-preserving localization technologies that meet the needs of future positioning networks; to improve the robustness and accuracy of GNSS and non-GNSS navigation and tracking algorithms, and to train researchers in the area of signal processing for wireless navigation and communications.

**Research interests**
- Baseband receiver processing for localization, tracking and navigation
- GNSS receiver design
- Indoor localization
- IoT signal processing for navigation and communication
- Cognitive positioning
- Location Based Services
- Human mobility models for eHealth applications
- Physical later security in mobile localization and tracking

**Top 5 achievements**
- Co-editor of 2 Springer books on wireless positioning
- Co-author in 53 peer-reviewed journal publications and 126 peer-reviewed conference publications
- More than 85% supervised PhD and MSc students finding jobs in industry or academia within 6 months after their graduation
- Best presentation awards at ACM MELT 2015 and IARIA SPACOMM 2011

**Main positions of trust**
Associated Editor for three peer-reviewed international journals (Cambridge RIN Journal of Navigation, IET Radar, Sonar and Navigation journal, and GPS Solutions)
Regional correspondent for the IEEE Global Communications Newsletters
Member of steering committee of the annual **ICL-GNSS** conference

**Selected publications**

**Assoc. Prof. Elena Simona Lohan**
ORCID: 0000-0003-1718-6924
[TUTCRIS Portal](https://tutcris.tut.fi/), [LinkedIn](https://www.linkedin.com/), [group website](https://www.tut.fi), [Twitter](https://twitter.com), [ResearchGate](https://www.researchgate.net)

Associate Professor in wireless positioning since Oct 2013

**Research career**
- Visiting Scholar at Universitat Autonoma de Barcelona, Spain (since 2013)
- Academy Research Fellow (Sep 2011–Aug 2016)
- PhD in wireless communications from TUT, Nov 2003
- Visiting Professor at University Politehnica of Bucharest (Oct 2010–Apr 2011)

**Funding**
FP7: **MULTI-POS** (2012–2016)

**Contact information**
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Mission statement
My mission is to use understanding gathered from the interface between physics, chemistry, materials science and electrical engineering to understand and develop novel electronic devices, materials and systems that are energy efficient and environmentally sustainable.

Research interests
With regard to the mission above, a medium-term goal is the enabling of environmentally friendly and economically feasible energy autonomy through energy harvesting and storage, while a long-term goal is the development of high-performance, low-energy circuitry for computation and wireless communication. With regard to healthcare, a medium-term goal is enabling remote hospital level monitoring systems while long-term goal is to development of epidermal temporary tattoo-like monitoring devices.

We investigate technologies and solutions related to energy-autonomy (storage and harvesting), sensors, and circuitry. Strong emphasis is placed on scalable, low-cost manufacturing methods such as printing as well as their integration with more conventional component assembly methods. In particular, key focus areas of my group are printable energy harvesting and storage for distributed electronics, and new device and circuit approaches based on printable organic and metal oxide semiconductors.

Top 5 achievements
• Breakthrough paper (Nature) on solid state dye sensitized solar cell, over 2000 citations
• Development of polymer LED materials and devices to commercial viability (Hoechst, in cooperation with Philips)
• Development of fast, high contrast, printable electrochromic display technology (Ntera)
• World’s first printed organic charge pump operating at RF frequencies
• Energy autonomous wireless sensors enabled by printed energy harvesting and storage (Autovolt and PAUL projects)

Main positions of trust
Speaker of Education working group (through 2016) and core editorial roadmap team, Organic Electronics Association
Steering Committee, Centre for Innovative Manufacturing in Large Area Electronics, UK, since 2014
Reviewer/evaluator for EU projects since 2003
Advisory Board, German Materials Society 1999−2007

Selected publications
Mission statement
My main research field is related to power electronics. A power electronic converter is a device that converts electrical energy from one form into another. As an example a power converter may transform the DC electricity from a photovoltaic panel to AC electricity of a three-phase power system. The flexibility in power usage and generation in modern society would not be possible without power electronics. My passion is to find out why power converters experience harmful instabilities, unwanted disconnection from the grid and what are the reasons for unexplained power quality problems. My mission is to identify the sources of these unexplained phenomena and help the power electronics community to improve the quality of power converters. This is the key in transforming the current power system into 100 percent sustainable power system.

Research interests
My research area includes grid-connected power converters for renewable energy generation, DC-DC and DC-AC power converters, control design, dynamic modeling, analysis of impedance-based interactions and other forms of stability and power quality problems.

Top 5 achievements
• Research Grant: Academy of Finland, Post-Doctoral Researcher Position, Mitigation of harmonic resonances in three-phase renewable energy systems, 2016–2019
• Organizer of an annual workshop at TUT which aimed for industrial designers and PhD students: Frequency-Domain Based Analysis of Three-Phase Power Electronic Systems
• Danfoss Engineering Tomorrow Award was appointed to two of my PhD students in 2017

Main positions of trust
Guest editor, Energies, Special Issue “Power Electronics in Renewable Energy Systems”, 2018
Chairman, 2016 IEEE 8th International Power Electronics and Motion Control Conference (IPEMC 2016 - ECCE Asia)
Member of the IEEE Power Electronic Society since 2011

Selected publications
Mission statement
Network Security is an illusion. However, we are trying to bring it a bit closer to reality…

Research interests
I have published a significant number of papers in field-related journals and conferences and I have participated as a speaker in various conferences and workshops. My research interests include private and secure e-voting systems, reputation systems, privacy in decentralized environments, cloud computing, trusted computing, privacy preserving protocols in widely deployed networks and computer forensics.

Top achievements
- **Research**: Best Paper Award for the paper entitled "Vulnerabilities of Decentralized Additive Reputation Systems Regarding the Privacy of Individual Votes". In Mobisec, Aalborg, Denmark 17−19 May 2011.
- **Research & Group Coordination**: In 2015, I established the Cyber Security (CSec) research group at the University of Westminster.
- **Funding**: During the last four years (since 2014) I have successfully obtained funding from 5 EU Research proposals.
- **Teaching**: Staff Appreciation Award. Students voted me as one of the best staff members at the Department of Computer Science at the University of Westminster (academic year 2016/17).

Main positions of trust
I have been serving as a technical program committee member and reviewer in the following journals and conferences:
- IEEE Transactions on Cloud Computing;
- IEEE Transactions on Knowledge and Data Engineering;
- Elsevier Ad Hoc Networks Journal;
- Elsevier Computers & Security;
- Springer Journal of Trust Management;
- Springer Journal of Wireless Networks;
- The Computer Journal – Oxford Journals;
- Springer Journal of Grid Computing;
- IEEE Security and Privacy.

Selected publications
Mission statement

My mission is to understand how to engage people to work and lean using educational technologies. Since November 2014 I am also the director of the University Consortium of Pori. At UCPori my main task is to foster the cross-disciplinary research and education between the universities participating in UCPori.

Research interests

I have done research on educational technologies since 1990’s. Currently, my research interests include networked and mobile learning, mobile video storytelling for learning, and educational games. I have also been the Visiting Scholar at Stanford University, School of Education, H-STAR Institute several times between 2007–2014. I have been a PI in several international research projects, and have developed MoVIE, Mobile Video Storytelling platform for learning thru video stories at schools. We have used the tool in Finland, Greece, California, Spain and Singapore so far with students from first graders to 12th graders. The aim has been to create a tool that enables children to create meaningful digital video stories related to their learning, possibly in collaboration with another class in another country. In addition, I have studied how to apply gamification to working life in two separate projects. The first is related to the building management work. The aim is to identify, what kind of data from building management systems could be used as a basis for a gamified work process for the building management staff and service people. The second aims to improve the quality of the patient care process especially when the patient is released to home from the after the surgery operation done in a hospital.

Top 5 achievements

- Co-founder of the company DiSEL21 Oy, that provides EdVisto digital storytelling platform as a service (originated from my research).
- Member of the winning team at Ratkaisu 100 –haastekilpailu (Solution 100 challenge competition), Sitra. 16.11.2017.
- Voluntary work for the Satakunta Higher Education Foundation, that has led to donation of two tenure track professors at UCPori.
- National Coordinator, SAVI Innovations in Learning and Education. 2013–2014, Univ. of Helsinki. The SAVI connected 16 research groups in the Finland and the US in an effort to carry out significant advances in education and the learning sciences. Funded by Academy of Finland. In collaboration with Pepperdine University, USA.
- Supervisor of 7 completed PhD work.

Main positions of trust

Member of the Board, Sino-Finnish Joint Learning Innovation Institute, 2016– (coordinated by Univ. of Helsinki & Beijing Normal Univ.).
Member of the Board of the CICERO Learning Network, 2015– (coordinated by Univ. of Helsinki).
Member of the editorial board: Education and Information Technologies..

Selected publications

Mission statement
The mission is to research and develop the printed electronics technologies. The objective is to create enabling hardware and integration technologies for Internet-of-Everything (IoE).

Research interests
My research focuses on printed and hybrid printed electronics and its applications for example in digitalization of healthcare and in smart environments. Unlike traditional electronics, printed electronics is thin, flexible, and stretchable enabling novel form factor and applications. As an example, my research team has developed wireless skin-conformable “bio-patches” that measures ECG, respiratory rate, and temperature.

More precisely, the work will focus on:
• printed ultra-thin stretchable/soft sensors and electronics
• high-density patterning
• low-temperature annealing processes
• hybrid printed electronics and printed electronics in microelectronic packaging

Top 5 achievements
• Coordinator: VitalSens - Platform Technology for Affordable, Continuous Health Monitoring, research project between Finland and India (IIT Madras, HTIC, Chennai, India)
• AWARD: Special acknowledgement from Nokia Research Center: “the first functional GSM baseband engine integration using printed electronics”, Sep. ‘11th, 2007
• OE-A Roadmap 2017, Chapter Integrated smart systems OE-A Roadmap 2017
• PATENT: EP20160203433, Microelectromechanical device and method for manufacturing it

Main positions of trust
IEEE, Chairman of the IEEE CPMT Finland Chapter board, Jan. 2011 to 2014
Technical committee member in conferences: IEEE 6th ESTC, IEEE 5th ESTC, iMAPS & IEEE 21st EMPC
Tampere University of Technology, Tenure track committee, Jan. 2017 to Dec. 2019, Member of the Academic board, Jan. 2010 to Dec. 2010

Selected publications

Prof. Matti Mäntysalo
ORCID: 0000-0002-7780-6454
TUTCRIS Portal, LinkedIn, GoogleScholar, ResearchGate

Professor, Laboratory of Electronics and Communications Engineering

Research career
• 2013 Professor, (2013 Asst., 2016 Assoc., 2018 Full)
• 2015–2020 Academy research fellow, Academy of Finland
• 2013 Adjunct Professor, Digital Fabrication
• 2011–2014 Academy postdoctoral researcher, Academy of Finland
• 2011 Visiting scientist, KTH Royal Institute of Technology

Funding
Prominent (ENIAC-JU), VitalSens (Tekes-DBT, India), VBA (Academy of Finland), EpilPrint (Academy of Finland), Towards Digital Paradise (Tekes), Naked Approach (Tekes; strategic research opening), HealthSens (Tekes), etc.

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Mission statement

My passion is to convey, distribute and accumulate knowledge and skills. The methods for that include organizing conferences, seasonal schools, training networks, special sessions; acting as editor for books, journals and special issues; writing publications; and supervising and evaluating students, theses, articles, projects and professionals.

Research interests

CGRA, Coarse-Grained Reconfigurable Arrays. Reconfigurable circuit technology using word-level arithmetics, with short reconfiguration times and low power consumption. CGRA prototypes on FPGA, Field Programmable Gate Array, can also be considered as an overlay technology for higher level design entry and accelerated reconfiguration. Baseband architectures for wireless systems, based (to a large extent) on programmable and reconfigurable components, applying the SDR, Software-Defined Radio, concept. One of the targets is to have efficient implementations for the emerging 5G systems and IoT, Internet-of-Things. Cognitive Radio as a means of adding agility and intelligence for dynamic radio spectrum utilization.

Approximate and transprecision computing. Large savings in energy and execution time can be achieved by introducing an additional trade-off parameter, the quality or accuracy of the results, when the application is resilient to occasional errors. Even orders of magnitude savings are possible. In transprecision computing, the end-to-end result accuracy may be preserved despite of reduced precision of intermediate results, but with more modest savings of power, energy and time, compared to approximation. GNSS, Global Navigation Satellite Systems, receiver architecture, as well as wireless and multi-technology positioning applying terrestrial Signals of Opportunity.

Top 5 achievements

- Co-authored 350+ international publications and (co-)edited five Springer books
- Active in conference organization, e.g., General Chair in 20+ international conferences, in steering committees of four conference series, won two national conference awards (2005, 2013)
- Leading national and international doctoral training networks, e.g., TELESOC, MULTI-POS, DELTA, providing summer/winter schools, workshops, travel and exchange grants
- Graduated 21 PhDs and 135+ MScs at TUT, reviewer or opponent for 36 external PhDs worldwide
- Award-winning human presence detection wireless technology commercialized by Ekin Labs Oy / Radiomaze, Inc. (e.g. HIPEAC Technology Transfer Award 2013)

Main positions of trust

Senior member of IEEE in five societies (CAS, ComSoc, CS, SPS, SSCS)
Member of the IEEE CAS technical committee on VLSI Technology and Applications Associate editor in IJERTCS and Elsevier MICPRO. Guest editor in several journals. Director of DELTA doctoral training network of 200 PhD students 2014–
Member of HiPEAC European network-of-excellence 2008–
Head of EE MSc program at TUT 2014–2018
Research Integrity Advisor of TUT 2017–

Selected publications

Mission statement
Skill + fun = engineering.

Research interests
Energetic embedded systems in the service of mankind. Immaterial user interfaces.

Top achievements
• Presidential InnoSuomi Award 2003
• 10 patents

Main positions of trust
National Explosives Board, Vice President 2017–2018
CIED Safety and Security Board, Scientific Adviser 2005–
Kangasala City Council, Vice Councilman 2017–

Selected publications
• Quadrature Imbalance Compensation With Ellipse-Fitting Methods for Microwave Radar Physiological Sensing
• Combustion of Activated Aluminum
• Shadowtrack: A Novel Tracking System Based on Spread-Spectrum Spatio-Temporal Illumination
• A Single Burn Method for Full Pressure Range Propellant Characterization
• The Interactive FogScreen
Mission statement
I’m leading the Artificial Intelligence and Vision research group that studies broad range of computer vision, biomedical image analysis, and machine learning problems. Our grand challenge is to make computers to understand what they see in images and videos and to automatically extract structured information of the semantics of the scene.

Research interests
• Computer vision
• Biomedical image analysis
• Image based localization and visual inertial odometry
• Image based 3D modelling and semantic mapping
• Deep learning

Top 5 achievements
• Learning based image representations, object detectors, and human attention models (over 1000 citations and related software downloaded frequently).
• Automated breast cancer classification and deep learning based approach for knee osteoarthritis diagnosis from plain radiographs.
• Best doctoral thesis award (years 2006-2007) from Pattern Recognition Society of Finland.
• Co-founder, former CTO at IndoorAtlas Ltd.
• In total 63 peer-reviewed scientific articles, 2400+ citations, h-index 21 (Google Scholar).

Main positions of trust
Member of Pattern Recognition Society of Finland (previous member of board and secretary), of Institute of Electrical and Electronics Engineers, and International Association of Pattern Recognition. Reviewer for TPAMI, CVPR, IJCV, etc.

Selected publications
• Rantalankila P, Kannala J, Rahtu E (2014), Generating object segmentation proposals using global and local search. CVPR
• Rahtu E, Kannala J, Salo M, and Heikkilä J (2010), Segmenting salient objects from images and videos. ECCV
Mission statement
Enhancing and increasing the understanding of electromagnetic and electromechanical energy conversion systems.

Research interests
Our group works on modeling and measurement of electromagnetic components, such as electrical machines, transformers and inductors. Our specific interests include:
- Numerical modeling of electrical motors and generators
- Material modeling and power-loss analysis in magnetic materials used in electrical machines and power-electronics applications
- Coupled magneto-mechanical problems

Top 5 achievements
- 47 publications in international scientific journals
- 3 research projects funded by the Academy of Finland
- Emil Aaltonen Foundation project grant for 2017−2019
- International collaboration with 5 universities or research institutes from Italy, France, Belgium and Germany in form of common publications or researcher exchange
- Adjunct Professor at Tampere University of Technology, Docent at Aalto University School of Electrical Engineering

Main positions of trust
Member of the management team of the Graduate School of Electrical Energy Engineering, a national Finnish doctoral program, 2011−2012.
Review tasks for 18 international scientific journals

Selected publications
Mission statement
My main mission is to develop theories and practical techniques for advanced communications systems as a member of the strong international research community of this field, in cooperation with industry.

Research interests
My research interest are in communications signal processing and physical layer techniques for wireless communications and radio based positioning systems, including:
- Advanced waveforms for 5G and beyond cellular systems
- High-frequency (HF) communications
- Cognitive radio
- DSP-enhanced radio, i.e., dealing with RF imperfections in radio systems using advanced DSP algorithms
- Multirate signal processing and filter banks
- FFT-based (frequency-domain) signal processing

Top 5 achievements
- Contributions to strengthening research and teaching in the communications engineering field at TUT (main responsibility of curriculum development as Department Head in 1992–2010, PI/leader in various Academy of Finland, Tekes, and EU funded projects)
- IEEE Fellow 2008
- IEEE CAS Society’s Guillemin-Cauer Award, 1987
- Scopus h-index 27 (excluding self-citations)
- Supervisor for 18 doctoral theses and 100+ MSc theses

Main positions of trust
Senior Area Editor for IEEE Transactions on Signal Processing, 2015–
Member of Editorial Board on Signal Processing Journal (EURASIP), 2011–
Associate Editor for IEEE Signal Processing Letters 2006–2010
Director of the Academy of Finland -funded Doctoral Program TISE, 2000–2013

Selected publications
Mission statement
I want to save the planet. I educate and do research in order to integrate renewable energy resources to electric power systems. Global warming needs actions now and therefore the outputs of research results must be practical and applicable.

Research interests
Repo’s main interest is the management of active distribution network including distributed energy resources. The focus of research is on application of ICT and distribution automation to integrate distributed energy resources for network management. Holistic understanding of active distribution networks from business to components and from grid planning to operation is necessary to transform research results to practical actions in industry. This viewpoint is visible in research methodology which is based on real-time hardware- and software-in-the-loop testing of complex automation systems to prove usability of research results. Holistic viewpoint has been studied for example in flexibility service based congestion management and in conflict of interests between grid codes and local requirements in distribution grids.

Top achievements
- Very successful coordination and outcomes of EU funded IDE4L demonstration project (http://ide4l.eu)
- Widely accepted and utilized design methodology for distributed generation connection among Finnish distribution network companies
- Expertise in active network management and integration of distributed energy resources
- Strengthening of publication culture to accept holistic and demonstration results as well in addition to very specific publications

Main positions of trust
Associate editor of IET Generation Transmission and Distribution
Member of technical program committee of several conferences
Member of working groups: CIGRE SC B5 Protection and automation and SESKO SK8 System aspects of electric energy supply

Figure. Semantics of smart grid laboratory at TUT.
Mission statement
To develop myself and to serve humanity
by producing knowledge as well as
helping others in self-actualization.

Research interests
Wireless communications in all flavors (students and funding decide specific topics):
• Aerospace and marine communications for intelligent machines
• Communication networking based on small satellite technology
• Cooperation and co-existence of radars and wireless communication
• New applications of in-band full-duplex radio technology
• Statistical performance analysis of wireless communications
• Ultra-reliable low-latency networking for automated traffic
• Wireless power transfer and energy harvesting with communication

Top 5 achievements
• McKinsey-prize for the best M.Sc. (Tech.) graduate of the year 2006 at Helsinki University of Technology (HUT) awarded by McKinsey & Company and HUT
• Dissertation award for the best D.Sc. (Tech.) thesis of the year 2014 in Finland given by Tekniliikan akateemiset (TEK) and Tekniska Föreningen i Finland (TFiF)
• Säänkävää on tulevaisuus-prize for “the pioneering work in the development of the full-duplex data transmission technology” awarded by the Association of Electrical Engineers in Finland (SIL) and the Ulla Tuominen Foundation
• European Association for Signal Processing (EURASIP) Best PhD Thesis Award 2017
• Recognized 10 times as an Exemplary/Top Reviewer by various IEEE journals

Main positions of trust
Editor, IEEE COMMUNICATIONS LETTERS, October 2014–
Editor, IEEE WIRELESS COMMUNICATIONS LETTERS, May 2017–
General Chair and Technical Program Chair, biannual workshop series on Full-Duplex Communications for Future Wireless Networks held at IEEE International Conference on Communications and IEEE Global Communications Conference, June 2016–
Member of Technical Program Committee in 70+ international conferences

Selected publications
Mission statement
My mission is the development of the interaction between Tampere University of Technology and the industrial companies. This is done in cooperative research projects together with the companies. In these projects the research results developed inside the university are utilized in order to increase the competitiveness of the industrial companies.

Research interests
Present expertise and research interest includes energy harvesting technologies, electronic materials, electronics, magnetic materials, electrically conductive materials, magnetism. At the moment I am leading a research consortium where energy autonomous system for industrial application are developed.

Top achievements
- Highly Commended Paper Award, Electroformed conductor patterns in electronics manufacturing, Circuit World 2015.
- Outstanding Paper Award, Electroless copper plating and surface characterization of thermoplastic PPO based printed circuit boards, Circuit World 2010.
- More than 100 articles including peer reviewed articles patents and conference papers.

Selected publications
Mission statement
I strive to create methods and tools for intelligent data-driven software engineering. This entails combining data and views from different stakeholders for more comprehensive, automated, optimized software engineering. Further, I seek synergies between software engineering and other disciplines to improve software engineering and to create new innovations.

Research interests
My current research activities involve software project planning, software architecture design practices and search-based software engineering. In addition, my interests involve and the current topics are tightly linked to the following:

- Software project management
- Global software development
- Visualizing software development
- Utilizing user interaction data
- Continuous Deployment / DevOps
- Technical debt
- Software quality

Top 5 achievements
- Post-doctoral research funding, Academy of Finland (3 years)
- PhD thesis approved with distinction

Main positions of trust
The Finnish Society for Computer Science, member of the board
Program committee member for ICSE / SEET 2018
Faculty council for Faculty of Computing and Electrical Engineering, vice member
Proceedings editor, SPLST’15

Selected publications
Mission statement
Developing methods to reveal the dormant dynamics associated to the power electronic converters and the systems composing of them for providing reliably and predictably operating systems. Disseminating the research originated new information for the students via the courses in power electronics in order to improve the ability of the industry to respond to the new challenges in markets.

Research interests
Dynamic modeling, analysis, and control of the power electronic converters in conventional and renewable energy applications.

Top achievements
• T. Suntio, Dynamic Profile of Switched Mode Converter – Modeling, Analysis and Control, Wiley VCH, 2009
• Adjunct Professor, Aalto University, 2001–2011
• Adjunct Professor, University of Oulu, 2004–2009

Main positions of trust
Associate Editor in IEEE Trans. on Power Electronics since 2010.
Associate Editor in IET Circuits, Devises and Systems since 2013
Associate Editor in IEEE Journal of Selected and Emerging Topics in Power Electronics, 2018
Associate Editor in IEEE Trans. on Energy Conversion, 2018
A member of editorial board in Advances in Power Electronics since 2014
A member of editorial board in Energies, 2018–2019
Guest Editor in Energies, Special issue on Power Electronics in Renewable Energy Systems, 2018

Selected publications
Mission statement
I have been passionate about software development almost 40 year. My career is includes changes between industry and academia. While I’m currently working in a university I’m actively following the developments in the software industry.

Research interests
I currently have two main research interests:
• Data-driven software engineering: how utilize automatically collected data to improve software engineering practices and processes.
• Programmable world: how to utilize the emergency of the new internet-connected but heterogeneous devices as platform new software innovations.

Top 5 achievements
• During my times of doctoral studies managed development of the support tool for the specification method DisCo.
• In Nokia I had several roles in development and deployment of mobile Java technology MIDP. The work included standardization with the other companies industry and support for the Nokia technical and commercial teams.
• With dr Antero Taivalsaari I lead a project to HTML5-based phone application platform. A team of 10 people worked for couple of years to build the technology.
• In TUT contributed in development the concept of Liquid Web Software. I especially created the first concepts mobile agents (moving code) for Web applications.
• In TUT I initiated and lead the research on data-driven software engineering.

Main positions of trust
Member of the industrial Steering Group of ITEA2 (2007-2011). ITEA2 (now ITEA3) is an EUREKA research platform. In this role, while still working for Nokia Corporation I participated in evaluation of project proposal as well in reviewing of the progress of the projects.

I’m board member of Nokia foundation that has been created to support the scientific development of information and telecommunications technologies and to promote education of the sector in Finland.

Steering group member of INFORTE (www.inforte.fi) – organizer or networking and education events for PhD students.

Member of program and organizing committee of several academic conferences and workshops

Selected publications
• H Jarvinen, R Kurki-Suonio, M Sakkinen, K Systä, Object-oriented specification of reactive systems, ICSE 1990.
• K Systä, T Mikkonen, L Järvenpää, HTML5 Agents: Mobile Agents for the Web, WEBSIT 2013, LNBP 189.
• A-L Mattila, T Lehtonen, HTerho, T Mikkonen, K Systä, Mashing up software issue management, development, and usage data, RCoSE 2015.
Mission statement
My activity includes teaching and research having at the core signal processing, information theory, and statistical modelling disciplines, with the goal of advancing the knowledge and the methodologies in these areas. Together with my PhD students, we undertake most challenging and hot problems in science and technology, to be sure that the quest for novelty and innovation is targeted to the right applications.

Research interests
My research interests include light field image processing, plenoptic image compression, audio, image and data compression, genomic signal processing, and statistical signal processing. I am coauthor of two books and more than 250 publications in the fields of signal compression, image processing, bioinformatics, and system identification and I supervised 13 PhD dissertations and 12 MSc theses.

Top 5 achievements
• ICIP 2017 Light Field Image Coding Challenge Winner, Most Innovative Algorithm (with P. Helin and P. Astola)
• Best paper award 3DTV-CON 2016: “Sparse Modelling and Predictive Coding of Subaperture Images for Lossless Plenoptic Image Compression” (with P. Helin, P. Astola, B. Rao)
• United States Patent 8195452 “High-quality encoding at low-bit rates”, Publication Date 2012-06-05 (with A. Vasilache)
• Best paper award NORSIG-2004: “Protein is compressible” (with A. Hategan)
• “Traian Vuia” Award of the Romanian Academy for the year 1989 (with P. Stoica)

Main positions of trust
Chair 9th Workshop on Hot Topics in 3D Multimedia (Hot3D), July 2018.
Chair of Ad Hoc Group on JPEG Pleno - Light Field, February 2018.

Selected publications
Faculty of Computing and Electrical Engineering

Asst. Prof. Davide Taibi

ORCID: 0000-0002-3210-3990
TUTCRIS Portal, Website

Assistant Professor (tenure track) of Software Engineering, software maintenance and evolution, cloud architectures.

Research career
• Assistant professor (tenure track) at Tampere University of Technology from 2018
• Assistant professor at Free University of Bozen (Italy) from 2015
• Senior researcher at University of Kaiserslautern and Fraunhofer IESE (Germany) from 2013
• Post-doctorate researcher at University of Insubria (Italy) from 2011

Funding
Raiffeisen Online (2017)
Systems Gmbh (2017)
Province of Bolzano (2016–2017)

Contact information
Tampere University of Technology
Laboratory of Pervasive Computing
Korkeakoulunkatu 1
PO Box 553, FI-33101 Tampere, Finland

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Email: davide.taibi@tut.fi

Mission statement
Support companies in developing software with the highest quality and lowest cost as possible, investigating processes, architectures and tools to reduce the technical debt.

Research interests
The research interest are a wide-ranging in the area of software architectures, software maintenance and evolution, adoption models. He is actively working on the identification and reduction of technical debt, specially in case of migration from monolithic to cloud native applications. In this domain, he is investigating harmful antipatterns and bad smells that can increase maintenance effort. Moreover, he is supporting local companies to keep their software maintenance under control by applying continuous monitoring techniques to continuously recommend refactoring activities preventing faults.

Top achievements
Three top-journal (Jufo 2-3) accepted in the last year on microservices migration, and technical debt.

Main positions of trust
Elected as member of the board of committee of the Italian Software Measurement Association
Representative Member of the International Software Engineering Research Network (ISERN)

Selected publications
Mission statement
Solving key-importance problems in Micro-Electronics for Mobile Communication Terminals/Phones by creating novel circuit architectures for nano-scale CMOS/BiCMOS silicon technologies.

Research interests
Ultimate performance monolithic Voltage/Digitally-Controlled-Oscillators, ultrafast DCDC converters for power management units, battery-management-units, electronic circuits stability theory, algorithms and CAD development, CWFM-LiDAR ICs.

Top achievements
- Built a RF-IC Laboratory at TUT
- Published 80 peer reviewed works, mostly in IEEE journals and conferences
- Published 46 patents mostly in USA, Japan, Germany and France

Main positions of trust
Member of Editorial board of Journal of Low-Power Electronics, Reviewer of EU projects in Brussels, Reviewer of several IEEE transactions and conferences.

Selected publications
Mission statement
To do state of the art scientific research on solar photovoltaic (PV) power systems for supporting industry on the global market. Parallel to this are naturally teaching, education, societal activities, some organizational duties and other research activities related to electrical energy engineering.

Research interests
Renewable energy based electricity production and the related disruption of electricity systems. Especially of interest is the behavior of solar PV power systems under varying environmental conditions, improving the efficiency and operation of weather dependent PV power production, impact of PV power on grid stability and power quality and mitigation of these effects.

Top 5 achievements
• On the average 30 citations per publication according to Web of Science.
• Science done both in physics and in electrical energy engineering being qualified for professorship in both fields.
• Heading corporate level research activities within ABB Finland.
• The role in starting and coordinating scientific solar PV power system research at the Tampere University of Technology (and in Finland) to support Finnish export industry.
• Still doing science after heading organizations both in industry and academia for 15 years.

Main positions of trust
1991−95 Representative of the Physics Department in the University of Jyväskylä in the student selection board and responsible for the student entrance examinations in physics.
1991 Chairman of the Physics Club of Jyväskylä, section of the Finnish Physical Society.
1991−93 Co-responsible of the Annual Physics Contents for students in senior high schools of Central Finland and member of the board for selecting the Finnish participators to the Physics Olympics.
2007−8 Board member of the Center for Sustainable Energy Solutions SENTRE.
2006−15 Member of the Board of Fortum Foundation.
2009−16 Member of the R&D Board of Cleen Ldt.
2016− Member of the Stakeholders Forum of CLIC Innovation Ldt.

Selected publications
Mission statement
My mission is to advance the Finnish society by teaching smart students, conducting research on electronics and working with the industry.

Research interests
Description of my research activities based on, for example, on-going projects or methods that I use. A few selected keywords and their short explanation. Max. 17 lines.

Top 5 achievements
• Nine patents, most recent: FI20165724 (A) - Venyvä rakenne käsitäen johtavan polun ja menetelmä rakenteen valmistamiseksi.
• Company FORCIOT Oy established to commercialize force and pressure measurement technologies developed in the research group.

Main positions of trust
Evaluator EU FP6, FP7, H2020, IWT Flanders, ESRC of UK, RPF of Cyprus
Member and chairman of MATINE (Finnish Scientific Advisory Board for Defence )
Electronics chapter
Member IEEE and IEEE Computer Society

Selected publications
• Joutsen, A. S., Kaappa, E. S., Karinsalo, T. J. & Vanhala, J. / Dry electrode sizes in recording ECG and heart rate in wearable applications. 2017 EMBEC and NBC 2017
Mission statement
I am leading a research group called Ultra Video Group that develops tailored video coding solutions for various multimedia applications on diverse computing platforms ranging from low-power embedded devices to highly distributed cloud environments. My mission is to make the group a trailblazer for future video coding.

Research interests
- Development of our Kvazaar open-source video encoder
- Immersive 3D/360 video coding for virtual/­augmented reality (VR/AR) applications
- Video codec acceleration on FPGA with high-level synthesis
- Deep learning based video coding
- Future video coding tools and techniques
- Applications: real-time video coding, 4K TV production, VR games, intelligent vehicles, remote presence, video conferencing, video surveillance

Top 5 achievements
- Founder and leader of Ultra Video Group
- Supervisor of Kvazaar open-source HEVC encoder development
- Brought TUT into 4KREPROSYS, VIRTUOSE, and PRYSTINE consortiums
- Winner of ACM open source software competition award, 2016
- 43 scientific publications out of which 8 IEEE Transactions articles

Main positions of trust
Reviewer of tens of IEEE/ACM Transactions/Journals including CSVT, IP, SSC, MM, VLSI, SPL, DT, TCES, and TODAES
Publicity co-chair in IEEE International Symposium on Multimedia, 2018
Session chair in IEEE International Symposium on Multimedia, 2017

Selected publications
Mission statement
As a professor, my mission is development of electricity distribution and supporting society by doing relevant research work and development of high level education in area of computing and electrical engineering.

Research interests
My research interest is electricity distribution, especially network asset management and application of information systems. In more detail below.

In general the research and development of key information systems dealing with power distribution network operation and planning (e.g. network information system, distribution management system).

Development of new application for power quality and condition monitoring of distribution networks: Development of measurement devices and methods, development of data processing and analysis, development of practical processes and business models

Development of major disturbance management of electrical network, both from technical and societal point of view: Development of information system and system integration, development of situation awareness, studying power distribution as critical infrastructure, and studying the cooperation of different stakeholders in management of major disturbances.

Top 5 achievements
• Development distribution management system from scratch to product
• Development of reliability based network analysis from research to practice
• Generating interdisciplinary research area dealing with major disturbances
• Leading research of power quality and condition monitoring in close relation with power utilities and industry
• Leading the education of computing and electrical engineering

Main positions of trust
Member of Board, Urho Tuominen Oy 2015–2018
Member of Board, Fortum Foundation 2016 –

Selected publications
Mission statement

Sound in our everyday environments carries lots of information. My research group is developing computational methods to automatically extract information in sounds, as well as to process sounds. Sound recognition has applications in context-aware devices, acoustic surveillance, multimedia information retrieval, and sound processing has applications in enhancing sound for human listeners, for example in augmented reality applications.

Research interests

Development of signal processing and machine algorithms for audio processing and content analysis, for example source separation and speech enhancement, detection and classification of everyday sounds. Most commonly used methods applied include for example

- Deep neural networks, including convolutional and recurrent neural networks
- Spectrogram factorization techniques such as NMF on which I have done pioneering work.

The specific research problems addressed include

- Sound event detection and classification
- Sound scene classification
- Sound source separation and signal enhancement, both one-channel and multichannel

Top achievements

- More then 170 scientific publications that have been cited more than 6000 times.
- Recipient of ERC Starting Grant 2014, 1.5 M€.
- Four best paper awards, including two IEEE Signal Processing Society Best Paper Awards.

Main positions of trust

- Associate Editor, IEEE/ACM Transactions on Audio, Speech, and Language Processing, 2016–present.
- Chair of the Steering Group of Detection and Classification of Acoustic Scenes and Events, 2016–present.

Selected publications

Mission statement
The level of automation has increased in industrial applications all the time. The computational capacity and the new algorithms have made it possible. My mission is to develop and implement theories and methods to improve soft computing and to train young researcher in data science and engineering.

Research interests
Dr. Tech. Visa's research interests include multimedia and multimedia systems, adaptive systems, wireless communication, data security, distributed computing, soft computing, signal processing, computer vision, data mining, knowledge mining, and knowledge retrieval.

Top 5 achievements
It is important to serve the society and the companies. I have helped among others the following companies with their problem:
ABB: HPINet Web Inspection System
Environix: ChemPro100i
Patria: Aircraft Life Cycle Support
Posiva: Final Disposal
Rapiscan: Metor 6E walk-through metal detector

Main positions of trust
Chairman of the Pattern Recognition Society of Finland, Vice chairman of the Pattern Recognition Society of Finland,
Chairman of the International Association for Pattern Recognition, Workgroup TC3 Machine Learning.
Member of the Department Council of the Department of Information Technology, Helsinki University of Technology,
Dean of the Department of Information Technology, Lappeenranta University of Technology,
Member of the Board of Lappeenranta University of Technology,
Member of the Department Council of the Department of Information Technology, Lappeenranta University of Technology,
Member of the Department Council of the Department of Information Technology, Tampere University of Technology,
Head of the Department of Signal Processing, Tampere University of Technology,
Member of the Faculty Council of the Faculty of Information and Computer Technology, Tampere University of Technology,
Member of the Faculty Council of the Faculty of Computing and Electrical Engineering, Tampere University of Technology,
Member of the Advisory Board of The University Alliance,
Member and Vice Member of the Academic Board of Tampere University of Technology, Vice Member of the Scientific Advisory Board for Defense (MATINE).

Selected publications
- Rock texture retrieval using gray level co-occurrence matrixM Symposium 75
- Shape recognition of irregular objectsJ Iivarinen, AJE Visa, Intelligent Robots and Computer Vision XV: Algorithms, Techniques, Active …
- Comparison of Combined Shape Descriptors for Irregular Objects.J Iivarinen, M Peura, J Särelä, A Visa, BMVC
Mission statement
Kaisa’s professional mission is to contribute to the design and development of positive user experience (UX) of novel technological systems. People should be able to enjoy and have meaningful interactions with technological systems in their everyday life environments.

Research interests
Kaisa’s research interests cover, but are not limited to:

• User experience design and evaluation of ubiquitous systems
• Mobile interaction research: social interaction, multi-device user experience and augmenting humans with wearables
• Human-centered design methods and processes in product development

The overall goal is to conduct multidisciplinary Human-Technology Interaction research that has societal impact in addition to scientific excellence.

Top 5 achievements
• Co-leadership of ALL-YOUTH consortium (2018–2023) in which our aim is to develop new digital services that enable youth to participate in sustainable societal development
• Supervision of twenty doctoral students to completion – and further theses in progress
• Establishing the study major in usability (2007) and first international user experience Master’s programme (2014) in Finland
• Setting and scaling up of the first research team on end-user needs and user-centered design methodologies at Nokia Inc, in 1990s and 2000s
• Acquiring of over 6 Meur of funding for user experience research (since 2005)

Main positions of trust
Member of Research Council of Natural Sciences and Engineering, Academy of Finland (2013–)
Chair of the steering committee of the MobileHCI conference series, ACM SIGCHI (2016–)
Editorial board member of Interacting with Computers journal (IwC), Oxford University Press (2009–)
Member of Research Ethics Committee for human sciences for Tampere region (2014–)

Selected publications
Mission Statement

The mission of the Faculty is to be the most acknowledged university-industry collaborator in Finland. This is achieved by creating deep and long-lasting partnerships with companies. The main instruments in these partnerships are world class research and rapid dissemination of the obtained research results. Our research themes include challenges, e.g., in systems engineering, autonomous machines, engineering materials science and applying Machine Learning and Artificial intelligence in the Engineering Sciences.
Mission statement

My research and teaching activity aims at developing and teaching new tools for supporting the design, manufacturing and decision processes in Engineering. Additive Manufacturing production regularity improvement is at the center of my research activities currently.

Research interests

Dr. Coatanéa is a Professor of Production Engineering at the Faculty of Engineering Sciences, laboratory of Mechanical Engineering and Industrial Systems, Tampere University of Technology, Finland. He was Marie-Curie fellow in 2005-2007. He held several visiting professorships at different universities. Dr. Coatanéa is in charge of the Additive Manufacturing group at Tampere University of Technology. His research interests include:

- Efficient dynamic control and development of additive manufacturing methods based on Directed Energy Deposition.
- Knowledge encoding in form of causal graphs.
- Integration of existing knowledge and design of artificial neural networks topologies using causal graphs.
- Dimensional analysis theory and its combination with causal graphs.
- Causal graph networks for decision-making support.
- Optimization and creativity support in design.
- Early design process, automatic extraction and analysis of requirements.
- Metrics for system design.

Top 5 achievements

- Co-creation of 2 spin-off companies: Dynavio Osuuskunta Oy (https://www.dynavio.com), Selko Oy (http://www.selko.io)
- Developing support tools for design and manufacturing and good quality publications.
- Educating talented and motivated students
- Awarded US DoD research contract for DACM: A framework for specifying, validating, and analyzing system models from a Model-based System Engineering perspective
- Individual Marie Curie Fellowship grant

Main positions of trust

Commitment in companies:
Dynavio Cooperative Oy, co-founder and Head of the Board,
Selko Oy, member of the board and advisor
Commitment in scientific institutions:
Member of the NSERC (Natural Sciences and Engineering Research Council of Canada) expert selection committee for NSERC Canada Chairs in Design Engineering.

Selected publications

- Paris H., Mokhtarian H., Coatanéa E., Museau M., Flores Ituarte I., Comparative environmental impacts of additive and subtractive manufacturing technologies, CIRP Annals 2016.
Mission statement
I try to learn and develop design tools and methods to manage structural and dynamic complexity of mechanical and mechatronic systems. My research is aiming to industrial competence of companies as well as high impact on research and publications. I am keen to continuously develop my teaching and discover new ways for learning.

Research interests
My main interest are design tool and methods that enable engineers to understand and design complex machine systems. This chain starts with elicitation and prioritization of requirements and reach to co-design with stakeholders using virtual prototypes. Simulation tools with different modelling fidelity enable finding of optimal design within different timescale and accuracy. Parametric, low-fidelity models are especially useful in early-design phase as they allow to comprehending the possible design space in fast way.
In product design, prototypes are generally used to ensure that the forthcoming product fulfills the design goals. In case of complex product geometry this is challenging even with 3D CAD models. Virtual reality technology enables studying of 3D models in real size and from real perspective. Due to this, all stakeholders can bring their expertise to the design process and enable effective co-design.

Top 5 achievements
• Developing WinSIMU software for simulating stiff fluid power systems. This code was later commercialized in ADAMS/Hydraulics. Both of these codes were in active used in several Finnish companies for simulating hydraulic driven mechanics.
• Published few state-of-the-art models of fluid power components.
• Virtual Design of Machine Systems and Structures (ViDIMS) consortium with LUT and Aalto University was ranked to second evaluation stage in call of The Centre of Excellence Program by Academy of Finland in 2011.
• Supporting the commercialization of research group’s knowledge in Virtual Reality Technology via Savant Simulators Oy spin-off company.
• Open research interaction with industry.

Main positions of trust
Member of ASME and Design Society.
Member of international advisory board in several conferences.
Reviewer in several scientific journals

Selected publications
I am determined to solve challenging robotics problems, build autonomous robots to work for human and with human, and train future robotics engineers to be able to do so. The future will witness worksites with mobile machines that are tele-operated or work autonomously and are only being supervised remotely. These machines will also be safe and trustful to be in the vicinity of humans. They will be “self-aware” and consume less energy. Increasing safety and productivity, and reduced cognitive and physical burden on human are my motivations.

I am interested in generating optimal robotic motions under dynamism and constraints. Fuel economy is of paramount importance specially for heavy duty and mobile machinery where energy autonomy and emissions matter. These machines are build of many components that need to move in harmony to do their job.

Other subject of interests are rigid as well as non-rigid material handling in industrial domain, such as pallet handling and earth moving. Robot kinematic constraints and singularities, actuator limits, environment constraints, redundancies, perception uncertainty, world variability create computational challenges. My methods include nonlinear and adaptive control techniques as well as optimal control with costs and constraints, exploiting special features of the problem for efficient numerical calculations and stability.

Modeling earth moving process and employing above mentioned classical techniques prone to fail due to variability of earth granularity, moisture, etc. AI techniques such as learning from human demonstration provide frameworks to program robots without explicit programming.

Robotic work machines need to follow social norms to create trust and comfort among human coworkers. These can be addresses by, for example, creating social forces or modeled as social costs in optimal control problems.

Over 100 citations per year since 2009
H-index 19 (google scholar)
PI for ActiveFit, funded by Academy of Finland, to build novel robotics soft actuators
Cracking singularity problem of wheeled robots with independently steerable wheels
(accumulative 7 JuFo points on the topic)

Responsibility for Major in Robotics at TUT
Associate editor for IEEE Int. Conference on Robotics and Automation (ICRA)
and for IEEE Conference on Control Technology and Applications (CCTA)
Opponent in Aalto University and University of Montpellier

Selected publications
Mission statement
Experimental basic scientific research focusing on the high strain rate material behavior, as well as industrially relevant problems concerning impact and other high rate phenomena of all materials including rocks, metals, polymers, and composites. Strong focus on high speed imaging and digital image analysis.

Research interests
My current research interests are closely related to the experimental characterization of material behavior under dynamic loading. I am interested in developing experimental characterization methods for high and low temperature testing at high strain rates, and various high speed digital photography and digital image correlation techniques for studying dynamic phenomena. More detailed examples include effects of strain rate and temperature (adiabatic heating) on the strain induced phase transformations, percussive drilling of rocks and concrete, plastic deformation of high entropy alloys, modeling of the stacking fault energy, and characterization of the effects of adiabatic heating on plastic deformation using simultaneous high speed optical and infrared imaging. Keywords; Split Hopkinson Pressure Bar, Digital Image Correlation, high speed infrared imaging, high speed optical imaging, dynamic material behavior, impact engineering.

Top 5 achievements
• Development of various high strain rate testing techniques for high and low temperature testing at various length scales
• Developer and coordinator of the double degree Master’s program with UPM Madrid
• Inventor and developer of the patented CardiomeDIC technology for using optical image analysis during open heart surgery
• Received a recognition and appreciation for Outstanding Services as a presenter in the International Symposium on Advanced High Strength Steels for the Ground Transportation Industry; 2006, Cincinnati, OH, USA
• European Champion of medieval jousting, 2018.

Main positions of trust
• Associate Technical Editor of Journal of Dynamic Behavior of Materials (Springer-Nature) since 2016
• Member of the governing board of the DYMAT Association since 2016. DYMAT is an European association for the promotion of research into the dynamic behavior of materials and its applications.

Selected publications
Mission statement
My main purpose is close and fruitful collaboration with industry by utilizing latest basic and applied research results in the field of heavy machinery to reach competence to companies. As well to educate young professionals both in academic positions and qualified workers to industrial enterprises in the fluid power automation area.

Research interests
My research interests are in heavy machinery where the fluid power and automation joins together to complete at the end the autonomous actions. The another topic area in my research activities is the common rail fuel injection systems in which I have worked already 25 years. Recently, in both of these fields, I have worked with problems how to predict the useful lifetime of the systems. By the aid of digitalization it is possible to analyze, control and predict the behavior of the autonomous working machines and develop new ways to utilize the information.

Top 5 achievements
- Demonstrate the fully autonomous wheel loader in Conferences Mobile 2012 and 2017
- Being involved for the research of Common Rail fuel injection system with a company since 1991
- Invited speaker in the International Conference on Fluid Power Transmission and Control, Hangzhou, China (ICFP 2013 and 2017), in the IEEE 7th International Conference on Fluid Power and Mechatronics, Harbin China (2015) and in the 10th JFPS International Symposium on Fluid Power, Fukuoka Japan (2017)
- Member of Centre of Excellence in Research in Academy of Finland 2000—2006 and 2008—2013
- Academy research fellow, Academy of Finland 2000—2003

Main positions of trust
Member of board of Centre of Excellence in Research GIM 2008—2013
Member of Editorial Board of International Journal of Hydromechatronics, Inderscience, 2017-
Member of International Advisory Committee of the Conference on Fluid Power Drives, Aachen and Dresden, 2012, 2016, 2018
Member of international program committees of Mechatronics 2012, Linz, Austria, International Conference on Fluid Power Transmission and Control (ICFP 2013 and 2017, Hangzhou, China
Chairman of the Scandinavian International Conference on Fluid Power at Tampere 2015 and 2019
Member of Advisory board of One Sea – Autonomous Maritime Ecosystem, 2017 -

Selected publications
Mission statement

World needs new multi-materials that are mechanically strong and tough in the practical continuum framework. These materials must be sustainable - even programmable to become compostable. These materials are researched via synthesis, experimental characterization, and numerical simulation.

Research interests

I target to progress the research of load carrying composite materials, focusing on:
- scalability of thermo-mechanical features from micro to macro length scales;
- fracture, environmental degradation, thermo-mechanical deformation, and the durability of any bio-organism response;
- I love multi-disciplinary studies that combine various characterization methods, quantitative experiments, and finite element modelling.

Top 5 achievements

- The establishment of the annual Composite Hack event combining industrial activities with the education at TUT and TAMK
- First PhD thesis as an adviser (T. Pärnänen, Aalto University, 2016)
- PI in the Luxturrim5G project’s share of TUT, new composite material solutions for the 5G era, funded by Business Finland (TUT’s budget 1.1 million €), 2017—2019
- Representative of Finland in the International Council of Aeronautical Sciences (ICAS)
- Patent initiative about stainless steel mesh surface treatment for composite materials (Aalto University, Department of Applied Mechanics, 2013)

Main positions of trust

Committee member of the Programme Committee of ICAS
Committee member of the Early Career Sub-Committee of ICAS
Committee member of the Membership and External Relations Sub-Committee of ICAS
Committee member of Finnish Society of Aeronautical Engineers
Committee member of Sampe Finland

Selected publications

- M. Kanerva, M. Lassila, R. Gustafsson, et al., Emerging 5G technologies affecting markets of composite materials, White paper, Exel Composites, 2018
- M. Kanerva, J. Jokinen, E. Sarlin, O. Saarela, Apparent Fracture toughness versus micro-scale fracture toughness of interfaces—the challenge of critical values, ASTM MPC, 2014, Vol. 3 (SPEC ISS); 173—188.
Mission statement
My mission is to conduct research in close cooperation with industry in the area of intelligent machines and systems. The objective is to create new knowledge in the area mechatronics which can be applied in real products and processes, but also published in high level scientific journals and conferences.

Research interests
My research interests are wide-ranging in the area of intelligent machines and systems. My research focus is in mechatronics - especially in design and analysis of complex machine systems my special expertise being in motion control, fluid power systems and high pressure water systems. I am also interested in industrial internet solutions in life-cycle management of intelligent machine and manufacturing systems.

Underwater robotics and systems is one of my group’s expertise area where we are focusing on research of mechanical designs, propulsion systems and control of different kind of robots.

We have a long history on research of aircraft systems - especially related on flight control and fuel systems. In addition we do research on system reliability analysis of aircraft systems.

System availability and preventive maintenance is also one of my group’s research focus areas. Our approach is based on knowledge based analytics which combines contextual technical expertise and tools with statistical methods in order to improve predictability of system behavior.

Top 5 achievements
• The establishment of SMACC. Smart Machines and Manufacturing Competence Centre (smacc.fi) is established in 2015 together with VTT and TUT. SMACC consists about 300 researchers in the area.
• Methodologies for aircraft maintenance operations. New modelling methods and spare-part optimization for military aircraft systems.
• METVIRO- virtual learning environment for education of forest machine technicians. Learning environment is based on dynamic system simulation and multiple views of the system.
• EU-project UNEXMIN for developing new autonomous robot for flooded mines
• Enhancement of industry-academy –cooperation in numerous research projects

Main positions of trust
Fellow, International Society of Engineering Asset Management (ISEAM)
Matine, member of Tampere sub-committee
Chair of WCEAM 2015 and SICFP’11–conferences

Selected publications
Mission statement
Conducting scientific and applied materials research in collaboration with domestic and international partners. Furthering the (international) career of young scientists and engineers.

Research interests
My current research interests are the dynamic behavior of materials, development of high strain rate experimental techniques, and impact and abrasive wear of materials. The newest topics are the application of non-contact full-field visual and infra-red techniques for the studies of plastic deformation of materials at various time scales (strain rates), temperatures, and length scales. Keywords: plastic deformation; high strain rate; Hopkinson Split Bar; Split Hopkinson Pressure Bar; digital image correlation; infrared imaging; high speed imaging; abrasive wear; impact wear.

Top 5 achievements
• Development of computer programs for the simulation of transmission electron micrographs containing dislocations and stacking faults
• Development of various techniques for conducting high strain rate experiments in a wide range of temperatures
• Founding and managing Tampere Wear Center (TWC) (2008—2018)
• Inventor Award (Resonance Ultrasound Spectroscopy), Los Alamos National Laboratory, New Mexico, USA (1992)
• Knight, First Class, of the Order of the White Rose of Finland (2014)

Main positions of trust
DYMAT Association (European association for the promotion of research into the dynamic behavior of materials and its applications), Member of the Governing Board, 2006—2016
Head of the Department of Materials Science, Faculty of Automation, Mechanical and Materials Engineering, Tampere University of Technology, 2008—2013
Head of International Materials Science Degree Program, Tampere University of Technology, 2008—2012
Member of the Program Management Committee (PMC) of FIMECC SHOK Project “Demanding Applications” (2009—2014)
Member of the Steering Group of FIMECC SHOK “Breakthrough Materials”, 2012—2014

Selected publications

Contact information
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Phone: +358 40 849 0040
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Mission statement
Researching and developing sustainable solutions for packaging field. The challenges today are high-barrier and thin coatings, materials from renewable resources and sustainable packaging materials, as well as, development of technology for processing them.

Research interests
R&D is focused on (co)extrusion coating, laminating, and paper, paperboard and polymer processing, converting and packaging technology. Roll-to-roll fabrication of packaging materials include sustainable wood-, plant- and polymer based raw materials. Characterization of tailored packaging end-product properties.

Top achievements
52 patent applications

Main positions of trust
Editor of book: Paper and paperboard converting

Selected publications
Kompostoituva pinnoitettu paperi tai kartonki, menetelmä sen valmistamiseksi sekä siitä saatuja tuotteita; Kuusipalo, J., Nevalainen, K. & Penttinen, T. 2003 Pat. FI 112624 B
Chitosan as a coating additive in paper and paperboard; Kuusipalo, J., Kaunisto, M., Laine, A. & Kellomäki, M. 2005 In : TAPPI Journal. 4, 8, p. 17—21
Mission statement
Manufacturing is the backbone of every modern society, contributing to the stability and welfare of the society. The competitiveness and sustainability are strongly related to the continuous success in R&D&I efforts. The curiosity to find unique combinations and durability to master the emerging technologies are the sources for differentiation, continuous renewal and ultimate success.

Research interests
My research area includes three main interest areas relating to the technology, tools and processes, the fourth interest area is continuous learning.
Manufacturing ICT: formal knowledge representations and engineering knowledge management, evolving production systems, systems engineering and agent-based/holonic manufacturing systems (in heavy metal/ discrete part manufacturing).
Robotics: Human-robot interaction and collaboration, Industrial robotics, virtual commissioning of robot systems and system design.
Circular economy: Technical cycles in the CE, especially re-manufacturing, socially sustainable manufacturing
Continuous Learning: “Learning to learn” - methods, versatile methods and tools for learning in technology-rich environments
 Currently running projects contribute to development of reconfigurable manufacturing systems, circular economy capability assessment and development from manufacturing perspective, human-robot collaboration in heavy metal industry and deployment of digital twins for learning environment in production engineering.

Top 5 achievements
• Grant from Technology Industries centennial foundation for Human-robot collaboration research, (2016—2018)
• Local Staff chair, European Robotics Forum 2018
• Invited speaker in ManuFuture 2017 conference
• Invited speaker in Leading Enabling Technologies for Societal Challenges (LET’S) 2014 conference
• Best Paper in APMS 2016 conference

Main positions of trust
Member of European Factories of the Future Research Association (EFRRA), and member of ManuFuture
Member of the Robotics Society in Finland
Publication Panel of Finland, Vice chairman of panel 8 “Civil and Mechanical Engineering”
Evaluator for European Commission in FP7 and H2020 proposals
Custos in doctoral defence in TUT, 2015; Member of evaluation committee for PhD thesis in KTH, 2017
Reviewer for international IEEE, IFAC and CIRP conferences and journals

Selected publications
Mission statement
My aim is to provide advanced tribological expertise and solutions for developing future design concepts for machine elements such as gears, bearings and frictional joints to improve their performance and service life. This work is done with close collaboration with industry using high standard numerical and experimental methods.

Research interests
My research focus is on tribology, which investigates the friction, wear and lubrication of contacting surfaces as well as related fundamental failure mechanisms. This gives basis for the analysis and dimensioning of machine elements and systems in terms of their performance and service life. The research topics are typically derived from real industrial problems. Theoretical research concentrates on numerical modeling and simulation of dry and lubricated contacts targeted at various applications. Experimental work is carried out for the verification of the models as well as for the testing and monitoring of real applications. Special interest is focused on determining the micro-scale contact effects on macro-scale designs. Main applications are frictional joints (fretting), bearings and gears related to, for example, combustion engines, mineral crushers and gear drives in wind turbines and marine applications. Advanced tribological contact design improves energy efficiency, power density and reliability of machine elements and systems having essential contribution to Finnish industrial competitiveness.

Top 5 achievements
• Fundamental understanding of fretting induced friction, wear and fatigue - utilization in industrial applications
• Detailed understanding of gear contact fatigue and scuffing behavior
• Development of novel experimental methods and numerical models for evaluation of hybrid sliding bearings
• Large-scale, full power, bevel gear test rig (up to 2 MW, company owned) for long term R&D of real gears. Laboratory installation - industrial collaboration.
• Advanced in-house developed test rigs and methods for evaluation of performance and service life of tribological machine elements

Main positions of trust
Corresponding member: International Tribology Council (ITC), 2001–
Member of Nordic Scientific Advisory Board: NORDTRIB conference series, 2000 –
Member of Editorial Board: Finnish Journal of Tribology, 2015 –
Member of Doctoral Programme Committee, Faculty of Engineering Sciences, 2014 –

Selected publications
Mission statement
I am doing my work with close collaboration with industry by utilizing latest discoveries of natural sciences. My research focus is in advanced ceramics and the processing of them from particles to structures and surfaces with extreme performance. The research is aiming to industrial competence of companies, high impact research and publications.

Research interests
I am doing research with advanced ceramic. I am head of laboratory which gives me great and broader view to hot materials science research topic and also to University actions. I am working in between of natural science and engineering materials with young and active research group.

My research focus is in advanced ceramics and engineering ceramics and processing of them from precursors to functional structures. We do research on the whole manufacturing cycle of ceramics from powder synthesis to colloidal processing, shape forming and sintering. Current focus is in 3D printing of ceramics. We are also charting the use of secondary raw materials such mine tailings.

Functionality is created with surface modifications and coatings aiming to hydrophobicity, dirt repellence, antimicrobiality, photoactivity and photovoltaic phenomena. Functionality of thin films and nanostructures can also be found as surprising plastic behaviour of ceramic materials. Current focus is in sustainable, supercritical CO₂ processing of ZnO and TiO₂ surface structures and nanowires.

Top 5 achievements
• Helping of commercialization of long-term research around colloidal processing monitoring as spin-off company ColloidTek Oy and continuation of research on topic.
• Zn-based nanowire synthesis by environmentally friendly supercritical carbon dioxide processing, that has both academic and industrial impact.
• 3 patents in year 2017 from different topics.
• EU H2020 FET project "Nanostencil", which combines supercritical processing with laser assisted synthesis.
• Improvement of open research interaction between industry and academic research.

Main positions of trust
European Ceramic Society (ECerS) Council member, 2013-
Secretary of Finnish Ceramic Society, 2013-
Member of International advisory board, 15th ECerS at Budapest, Hungary, 2017
Head of EMASS (Engineering Materials Science and Solutions) research community at TUT

Selected publications
Mission statement
My target is development of methodologies for digitizing manufacturing industries. On that path I am looking for tools frameworks, modelling languages and structures to support efficient product and production systems (co-)development.

Research interests
In the past, I have participated in a number of European projects and taught courses in the field of factory automation and industrial informatics. I see digital manufacturing as a natural path, where production processes and product design could benefit from integrated methodologies and thereby make it easier to share data and make better decisions during the lifecycles of both products and production systems.

My research interests include digital transformation of the manufacturing industry, which is driven forward, among others, by the Industrial Internet of Things. The ultimate goal is to develop production systems that are highly reconfigurable and adaptive. While there are already some standards available, their large-scale application is still to come. We’ve made some progress since Henry Ford made the ‘any colour so long as it is black’ comment in the early 1900s, but we still tend to approach product variability by enumerating possible choices often unable to go “outside the box”. If we used to have only one colour, we may now have 16. Imagine a manufacturing plant that produces items in response to the specific needs of individual customers. The plant owner might not even know or fully understand what his machines are working on. As a researcher, I continue digging for the pieces required to build such a production system.

Top achievements
- Best Presentation Paper Award at the 6th IEEE International Conference on Industrial Informatics;
- Best Paper Award at the 12th IFAC Symposium on Information Control Problems in Manufacturing;
- Best Paper Award at the 7th International Conference on System.

Main positions of trust
TUT representative at the Advisory Committee of World Wide Web Consortium (W3C). Chair at the community group at W3C for the open Knowledge-driven Service-oriented System architectures and APIs (KiSS);
Chair for Tools at the IEEE International Conferences on Industrial Informatics.
Served as a technical coordinator of the eScop project.
Member of the Council of non-profit organization “Russian School of Estonia”.

Selected publications
Mission statement
The mission of our research group is to refine and develop the understanding of relationships between processing, structure, properties and performance of novel metallic materials in demanding engineering applications in co-operation with workshops and metal producing industry.

Research interests
Metals technology is a wide research area spreading from the development of new alloys to the utilization of new manufacturing methods in the production of structural components. The manufacturing methods we are interested in include (among others) bulk metal forming like forging and rolling, additive manufacturing, welding and heat treating. A common target for the whole research area is to understand how the final properties can be improved by the help of metallurgy. Briefly, the manufacturing methods define a metal’s microstructure, which in turn defines all mechanical properties. In practice our goal is to understand the basic events and mechanisms in the development of the microstructure and how they can be utilized to produce optimum properties. One new alloy group where we are focusing on is high entropy alloys. They are novel alloys exhibiting potential high temperature, wear and corrosion properties.

We also have a major focus on steel research, where the main driving force for the research and development of new low alloyed steel grades has been the automotive industry. Presently, the utilization of new heat treatment procedures in order to improve formability (especially press formability) is under investigation. Those include metal coated and uncoated press hardening boron steels, novel multiphase steels like Q&P and other steels utilizing transformation induced plasticity effect.

Top 5 achievements
- Jokiaho, et. al., Characterization of Flame Cut Heavy Steel: Modelling of Temperature History and Residual Stress Formation, Metallurgical and Materials Transactions B, 48(6), pp.2891—2901, 2017
- Zhou, et. al., The Effect of Strain Reversal and Strain-Time Path on Constitutive Relationships for Metal Rolling/Forming Processes, ECSC, EUR 19891, 2001
- Research grant for the research team 2015 and 2016 from Technology Industries of Finland Centennial Foundation
- ASM Finland Chapter, Arrangement of industrial seminar days twice a year 2006—2017

Main positions of trust
Executive committee member of International Deep Drawing Research Group (IDDRG) since 2011.
Chair of ASM Finland Chapter 2011—2017.
Board member of Finnish Association of Mining and Metallurgical Engineers (Vuorimiesyhdistys ry) since 2016.
Member of IISI’s Automotive Working Group AutoCo (later WordAutosteel) 2003—2006.

Selected publications
- Ryde, et. al., Cold-rolled complex-phase (CP) steel grades with optimised bendability, stretch-flangeability and anisotropy, RFCS, EUR 25041, 2012
Mission statement
I study and teach mathematical engineering: algorithmic and mathematical methods for solving technological problems.

Research interests
Statistical estimation, numerical analysis, mechanical vibrations, machine learning. Our current application area is mainly pedestal and robot positioning and navigation.

Top 5 achievements
• 150+ scientific publications; Scopus h-index 17
• Supervised 10 PhD theses
• Best paper award, Intl Fluid Power Workshop, Bath, 1994
• Organizer of Finnish Mathematics Study Group with Industry 2002 & 2004
• My group’s satnav orbit prediction algorithms are in commercial navigation solutions sold by our international industrial partner.

Main positions of trust
Head of MSc degree program in Science and Engineering 2008—2011.
IEEE Senior Member
Technical Program Committee: WPNC, IPIN, ICL-GNSS, ENC, UPIN-LBS

Selected publications
• R Piche S Särkkä J Hartikainen: Recursive outlier robust filtering and smoothing for nonlinear systems, MLSP 2012

Contact information
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Funding
Academy of Finland
Industry service R&D projects
Mission statement

I am interested in humans and robots interacting in complex environments. Industrial robots in manufacturing industry and service robots in domestic environments. Collaboration and assistance of robotics achieved through high-level autonomy, reasoning and cognition.

Research interests

- Human-robot interaction
- Cognitive robotics
- Human and artificial cognition
- Perception, navigation, manipulation
- Industrial and domestic service robots

Top 5 achievements

- Robotics major at TUT: TUTRobolab, curriculum development and industry participation
- Start and development of two spinoffs for (medical) robotic systems (MagnebotiX AG, Ophtorobotics AG), 2014-2016, ETH Zürich, Switzerland.
- Silver medal (2nd place) at Engineering Medical Innovation Global Competition (EMediC Global) 2016 for the development of a robotic system for automated injections into the eye.
- Best medical robotics paper award (ICRA 2015).
- First place in Mobile Microrobotics Assembly Challenge at ICRA 2014 and 2015 (Team leader of ETH Zurich).

Main positions of trust

- Board member (secretary) of IEEE CSS/RAS/SMCS Finland chapter.
- Member of IEEE and IEEE Robotics and Automation Society.
- Member of IEEE Technical Committee on Cognitive Robotics (TC-CoRo).
- Program committee member for IEEE MARSS (2017, 2018).

Selected publications

Mission statement
Develop understanding on the value of information in decision making and control so that autonomous systems can trade with data and constitute a network of observation/sensing/measurements services.

Research interests
ACTIVE SENSING AND SITUATIONAL AWARENESS:
“Where to look next?”
 = Where to focus the perceptive action?
 = How to operate sensing degrees of freedom for the benefit of the current task or for maximal situational awareness?
 = How to maximize the prior expectation of posterior optimal performance measure or quality of information?
What is the value of having the opportunity to make an observation?
The main methods and concepts: dynamic planning with incomplete information (partially observable Markov decision processes), Bayesian estimation and modeling (including machine learning), and information theory.
WITH APPLICATIONS TO: industrial processes (e.g. scanning sensors in papermaking), autonomous mobile machines (e.g. operable vision systems).

Top 5 achievements
• Supervision of 10 PhDs in 2007—2016.
• Planning algorithm for sensing on directed acyclic graphs, publication 1) below.
• Methods for optimal sensor control (with Mikko Lauri in his PhD thesis, and publication 2 below).
• Dynamic optimization of uncertain processes with applications to papermaking processes (with Aino Ropponen in her PhD thesis, and publication 3 below).
• Development and commercialization of KCL-WEDGE process analysis system in 1990-1999 (currently known as SavorWedge; 100+ installations in various process industries; by 1999 40+ installations); with many modern IoT properties (access to and joint advanced analysis of data from many mills throughout Europe by 1996).

Main positions of trust
Member of the board nomination committee for the new university resulting from merger of Tampere University of Technology, University of Tampere and Tampere University of Applied Sciences, 2017
Member of the Board of Forestcluster Ltd/FIBIC, 2013—2014, Vice Member 2012—2013
Member of the TUT consistorium 2011—2017
Member of the Scientific Council of European Forest Technology Platform (FTP), 2005—2007
Member of the Board, Papet OY (publisher the 19 volume book series Papermaking Science and Technology), 1998—2002

Selected publications
Mission statement

My research is focused on environmental resistance of interfaces in polymer based composites and hybrid materials. These interfaces can locate between macroscopic material components of a hybrid structure or between the microscopic constituents of a composite. The aim is to develop sustainable solutions for future materials and structures.

Research interests

My research is focused mainly on thermoset and elastomer based composites and polymer/metal hybrids. Tailoring the interfacial properties and controlling the degradation of reinforcements and additives are also included in the research projects. Typically, my studies start from the questions “How to improve the performance by tailoring the interfaces in the structure” or “How to solve the interfacial problems met in an industrial application”. In addition, I am very interested in the correlation between microscopic and macroscopic test results, which I think is the key to implement high level scientific research results into industrial applications.

My background and field of expertise lies in materials characterization: The weakest link at an interface and the evaluation of the effect of different environmental factors on the performance of the material are done by thorough thermo-mechanical, structural and microstructural characterization including electron microscopy and microanalysis. In addition, the TUT based FIBRobotics concept to study the mechanical properties of fibres and fibre/matrix interfaces in micro scale has enabled unique possibilities to study the degradation of composite materials in a reliable and efficient manner.

Top 5 achievements

- Successful development of novel polymer/metal hybrid structures and characterization of the polymer/metal interfaces
- Leadership of a technical work package in EU H2020 project FiberEUse
- Participation in the development work of the FIBRobotics concept
- PhD grant for four years, TUT
- Encouragement grant from the Finnish Foundation for Technology Promotion (TES), 2013

Main positions of trust

A member of the Science Council at Tampere University of Technology, 2011—2013; Committee member of Sampe Finland; Evaluator for the project proposals for EIT RawMaterials GmbH, 2017.

Selected publications

Energy is always needed for operations and functions of the machines. The use of energy has two aspects. Firstly, how we can use the energy efficiently in terms of machine performance. Secondly, how to minimize losses of the machine, system and process to minimize the consumed energy and pollution of environment.

My research interests are related to heavy mobile machines and their systems. The area covers the powertrain from combustion engine to actuators. The global trend toward sustainable machines and systems is strongly influencing the research and development of future powertrains and actuators. System knowledge with technologies such hybridization and electrification are key elements in future powertrain solutions. The versatility of machines, operation profiles together with new technological possibilities results that we have numerous solutions available to realize efficient and sustainable machines in the future.

Current research topics
- Electrification of loader
- Real exhaust emissions of machines and their reduction through hybridization
- Electrohydraulic pump actuators
- Hydraulic hybrids
- Power management

Top achievements
- Development of hydraulic free piston engine prototype
- Three granted patents
- Management of FIMECC-research portfolio

Main positions of trust
Chairman of KON-Section of Scientific Advisory Board for Defence Forces 2014 –
Member of the Board, FIMA ry 4/2013—2017

Selected publications
- **The diesel engine and its rivals – The future of powering non-road mobile machinery** 2016 FIMA Report, Tikkanen S.
- **Hybrid Pump Drive.** 2015, Tikkanen S., Tommila H., 2015 13th Scandinavian International Conference on Fluid Power, SICFP’15, May 20—22, 2015, Tampere Finland
Mission statement
My interest is in improving sustainability and efficiency of industrial production processes by control and optimization theories, algorithms, and information systems – and in promoting free research and in providing top-level research-based education both to professionals in companies and to degree program students in universities.

Research interests
The research interest is to find out how the traditional and modern control methods can be applied into areas where the measurements of the process outputs and the states are very difficult or impossible to obtain and where the classical state estimation methods are not applicable. Also, how the systems theory methods can be applied to the plant-wide applications where the dynamics of the unit processes and interactions between them are not traditionally considered. The approach is to apply modern sensors and measurements of variables loosely or indirectly coupled to process variables, and to consider other available variables that correlate to the yield and quality of the end products and efficiency of production. Also, the knowledge of process behavior as well as the first principles are used to improve control solutions.

Top 5 achievements
• Long-term co-development in research around colloidal processing monitoring and commercialization the achievements as a spin-off company ColloidTek Oy
• Development of new data acquisition approaches and control structures in rock crushing process
• Development of data acquisition and non-parametric system identification methods for switched-mode power converters.
• Multidisciplinary research of energy systems and markets in collaboration with electrical engineering, industrial management, and software engineering
• Modelling of industrial processes (e.g. copper smelter), and creating decomposition-coordination optimisation approach for scheduling the operations.

Selected publications
• P Itävuo, E Hulthén, M Vilko, Feed-hopper level estimation and control in cone crushers, Minerals Engineering, Volume 110
Faculty of Engineering Sciences

Mission statement
Continuous demand to provide sustainable material solutions for future society is the main driver for our research. Aiming at achieving comprehensive understanding on microstructural material properties, we cooperate with universities and companies to develop innovative materials and material processes for industrial applications.

Research interests
The research interests are wide-ranging in the area of materials characterization, main focus being on materials microstructural characteristics and their relation on other material properties and on non-destructive material performance evaluation.
Research on detailed microstructural characteristics of various materials is based on utilization of multi-scale characterization methods including electron microscopy with microanalysis and electron diffraction techniques and X-ray diffraction analysis.

Non-destructive testing enables the examination of a component without affecting to its future use. NDT methods can be used e.g. for materials surface condition and residual stress evaluation (magnetic Barkhausen noise and XRD).
Main aim is to gain knowledge on microstructural features and their influence on the materials performance through material characterization to design innovative, sustainable, energy-efficient and safe materials. Another goal is to develop NDT practices for efficient quality control and performance evaluation of materials. These provide detailed material know-how to be exploited in real industrial applications.

Top 5 achievements
- Detailed understanding on catalyst ageing phenomenon; Honkanen et.al. J. of Catalysis 349 19-29 (2017) and Applied Catalysis B:Environmental 439-448 (2016)
- Extensive survey on wear and rolling contact fatigue of finnish railway rails; Rajamäki et.al. Civil-Comp Proceedings 110 (2016)

Main positions of trust
Head of the Doctoral Programme in Engineering Sciences at TUT. Steering group member of Tampere’s LUMATE centre (Body aiming to encourage young people’s interest towards natural sciences, mathematics and technology), Member of the Tenure Track Committee at TUT and Board member of SCANDEM Nordic Microscopy Society.

Selected publications
- Santa-aho et.al. Barkhausen noise magnetising voltage sweep measurement in evaluation of residual stress in hardened components, Measurement Science and Technology 25(8) 1-6 (2014)
- Bihari et.al. Optimized dispersion of nanoparticles for biological in vitro and in vivo studies, Particle and Fibre Toxicology 5:14 (2008)
Mission statement
To use interfaces and interphases to tailor the properties of polymer based composites and hybrid materials with functional properties for demanding applications.

Research interests
My research has for last decade concentrated on processing, properties and applications of both soft and hard polymer matrix composites and hybrid materials. My interest includes melt processed thermoplastic nanocomposites, liquid molded long fiber composites and elastomeric composites. I use characterization methods including thermal analysis, mechanical testing and application oriented testing such as wear testing where we have designed and build the used instruments.

Top 5 achievements
• The teacher of the year award from Tekniikan edistämissäätiö 2014
• Teachers award (University’s 50th Anniversary Gala), 2015, TUT.

Main positions of trust
President of SAMPE Europe
Elastomery Journal Editorial Board Member
Organizing committee member of Eurofillers and Polymer Blends conference
Chairman of steering committee of TUT FabLab
Board member of three companies

Selected publications
Mission statement

Our research group does what we are always been interested in: scientific and applied research in order to understand the processing/structure/properties/performance relationships of advanced coatings and surface treatments, with a special focus in thermal spraying, laser and weld surfacing, and thin film technologies.

Research interests

Preparation of novel coatings and surface treatments by using various thermal spray deposition technologies, e.g. by plasma spraying, high-velocity oxygen/air fuel spraying (HVOF, HVAF), arc spraying, cold kinetic spraying, and flame spraying technologies, by high power laser and weld surfacing, and by magnetron sputtering. Characterization of microstructure and engineering properties of coatings and surface treatments. Performance of coatings in selected industrial applications, including mechanical engineering equipment, power generation processes, pulp and paper manufacturing, environmental corrosion and wear protection, and other functional uses of coatings.

Top 5 achievements

• ASM Thermal Spray Hall of Fame (ASM TSS HoF, 2017), American Society of Materials International, "For long term contributions for the advancement of thermal spray and related deposition technologies through worldwide education and practice."
• Fellow of American Society of Materials International (FASM, 2015), "For continuous and dedicated contributions towards the advancement of thermal spray, cold spray, and laser cladding technologies worldwide through education and practice”.

Main positions of trust

European Thermal Spray Association (ETSA), member of board of delegates (2009—present), vice president (2009—2017)
MetSta K11 (corrosion and surface treatments), member of standardization committee
ASM/TSS, American Society of Materials, Thermal Spray Society, member
Laser Institute of America, member

Selected publications

• Boletti, B. Bonferroni, H. Koivuluoto, L. Lusvarghi, P. Vuoristo, Depth-sensing indentation for assessing the mechanical properties of cold-sprayed Ta, Surface & Coatings Technology, 205(7), 2010, p. 2209.
Faculty of Natural Sciences

Mission Statement

We conduct world-class research in our selected focus areas: Light-Based Technologies, Bio- and Circular Economy and Computational Science. Secondly, we educate mathematically oriented professionals in some of Finland’s most competitive degree programs. Thirdly, we are a visible societal actor by developing Finnish science and education, carrying out public outreach, and collaborating with high-technology industries.
Mission statement
We perform atomistic scale simulations in materials science using electronic structure calculations (DFT), classical molecular mechanics (MM) and Monte Carlo (MC) method. We employ machine learning concepts to enable rational design of materials which provides an alternative approach for experimental trial-and-error methods.

Research interests
The general objective is to study the detailed atomic structure of a system and its function. The problems involve current technological applications in the fields of materials science, chemistry, and biochemistry. Characteristic for our application-oriented projects is the strong collaboration with experiments. The main topics are:

- Amorphous semiconductor materials in nonvolatile memory applications, especially chalcogenide alloys (DVDs, Phase-change RAM, Conductive-bridging RAM)
- Glasses in general: Novel oxide-based materials, chalcogens, pnictides, etc.
- Noble metal nanoparticles (Au, Ag, Pt, Pd) with various coatings and environments (surface, solution and biological environment)
- H2020-NMP project “CritCat”: Size-selected metal clusters as replacements of the Platinum Group Metals in heterogeneous and electrocatalysis (hydrogen energy, CO2 chemistry)
- Intermetallic alloys based on aluminum, titanium and steels; clustering, precipitate formation and hardening effects

Top 5 achievements
- Coordinator of the H2020-NMP project “CritCat” in rational catalyst design at TUT
- Coordinator of the AllDesign for intermetallic alloys (NTNU digitalization project)
- Revealing atomistic principles for rapid crystallization in phase change materials
- Chair and organizer of the European Phase Change and Ovonics Symposium 2012 and the Cluster-Surface Interaction Workshop 2018

Main positions of trust
Coordinator of the H2020-NMP project “CritCat” 2016-2019 (www.critcat.eu)
Deputy Editor-in-Chief of the open-access journal Advances in Physics: X (publisher: Taylor & Francis)
Advisory Board member of the Journal of Physics: Condensed Matter (publisher: IOP)

Selected publications
- J. Akola and R.O. Jones, Speeding up crystallization, Science 358, 1386.
Mission statement
I am passionate about investigating the fundamental interaction between light and matter at nanoscale and applying this understanding to light trapping, energy collection, and extraction, communication and sensor applications.

Research interests
We explore optical metamaterials, plasmonics, and nanophotonics to understand the interaction between light and nanoscale photonic materials and to control and manipulate these interactions at will dynamically.

The key areas of my research interests are the following:
• Development of nanophotonics based devices
• Nano-photonics and nano-optics for strongly confined light and their interactions: plasmonics, photonic crystals, metamaterials, and their applications
• Graphene and similar 2D crystal based nanophotonic devices
• Quantum metaphotonics and quantum metamaterials: Enhance light matter interaction with single emitters and enable collective emission of emitters
• Diamond NV Centers and hBN defect centers for quantum nanophotonics
• Epsilon-Near-Zero (ENZ) metamaterials, tunable and active metamaterials
• Metamaterial inspired Optical Nano-Circuits
• Plasmonic biosensors

Top 5 achievements
• Publications: 61, h index: 27
• The demonstration of electrically switchable metadevices which could yield new applications ranging from electrically switchable clocking devices to adaptive camouflage systems (Science Advances, 2018).
• The first n=0 metastructure in the visible spectral range. Highlighted as Viewpoint: Metal-Coated Waveguide Stretches Wavelengths to Infinity, Science Now: November 6, 2012, a news article entitled “Nanoscale Device Makes Light Travel Infinitely Fast”.
• Science Academy’s Young Scientist Awards Program (BAGEP) by Turkish Science Academy 2016.
• Unesco-Loreal Women in Science (Turkey) Award 2015.

Main positions of trust
• Reviewer of EU FP7 projects, H2020 FET 2017 Projects as Vice Chair
• MC Member of Finland for COST Action MP1403
• Early Stage Research Advisor of COST Action MP1403

Selected publications
Mission statement
I want to improve our understanding of the aerosol effects on air quality, human well-being, and climate. The core question is how new and existing technologies change the amount and formation processes of particulate matter, with a special focus on nanoaerosol and secondary formation processes. The final aim is securing cleaner technologies for the future.

Research interests
I research aerosol formation and evolution, which essentially means characterizing aerosols in high detail using experimental methods, and constructing detailed computational models of their processes. Key tools for the characterization are the TUT mobile laboratory platform, high-end instrumentation to characterize nanoscale aerosols such as the Particle Size Magnifier (PSM), or a Chemical Ionization – Time-of-Flight mass spectrometer (TOF-CIMS), and oxidation reactors to simulate atmospheric processing of emitted aerosol.

On the modelling side, my group performs computational fluid dynamics modelling for aerosols with our own aerosol-specific module, and utilizes detailed microphysical models to computationally simulate aerosol dynamics. Such models are also coupled with Gaussian dispersion models to account for simultaneous dilution and processing.

Top 5 achievements
• Over 100 publications in international, peer-reviewed publications, which have been cited over 7000 times, with a Hirsch-index of 41.
• Key role in high-impact study establishing traffic as a source of previously undetected nanoaerosol (Rönkkö et al., PNAS, 2017)
• Co-author in several key papers studying biogenic VOC role in atmospheric aerosol processes (2 in Science, 2 in Nature)
• Developer of methodology to analyze atmospheric particle formation that is still widely used in the atmospheric community after more than 10 years (Dal Maso et al., 2005, most cited paper in Boreal Env Res with 393 citations)
• Received the FAAR young Scientist award 2010

Main positions of trust
Vice president of the Finnish Association for Aerosol Research (FAAR)
Reviewer for 15 different international, peer-reviewed journals
Evaluator for several national research funding agencies (e.g. NERC, DFG) and the European Commission

Selected publications
I carry out both experimental and theoretical work in Photonics, the science of light. My goal is to study and harness nonlinear and ultrafast phenomena that occurs when short and intense pulses of light emitted by lasers interact with matter. These can then be used for the development of novel sources of light as well as for imaging and sensing applications.

Research interests
My research interests covers a wide range of both fundamental and applied research topics, including:
- coherence properties of light sources
- broadband supercontinuum light sources from the ultraviolet to the mid-infrared
- artificial intelligence approaches for engineering autonomous laser sources
- nonlinear materials
- ultrafast phenomena and nonlinear instabilities
- real-time measurement techniques
- novel imaging and sensing techniques

Top 5 achievements
- Laureate of the IUPAP (International Union of Pure and Applied Physics) Young Scientist Prize in Optics in 2011
- Fellow of the OSA (Optical Society of America) in 2017
- First demonstration of “ghost imaging in the time domain” published in Nature Photonics
- Review article on “optical instabilities and rogue waves” published in Nature Photonics
- Review article on “supercontinuum generation” published in Reviews of Modern Physics

Main positions of trust
Associate editor for Optics Letters (Optical Society of America) and Scientific Reports (Nature Publishing Group)
Grant proposal evaluator for multiple international funding agencies
Steering committee of UNESCO International Day of Light
Head of TUT International MSc program in Photonics
TUT coordinator of the national doctoral network on Modern Optics and Photonics

Selected publications
Mission statement

Optoelectronics represents the core technology powering the photonics science and applications by ensuring the interfacing between the electronic and photonic worlds. My research mission is to establish ambitious long-term research program extending from basic materials science to advanced technology, applications, and entrepreneurship.

Research interests

Prof. Guina conducts a comprehensive chain of research activities in optoelectronics including synthesis of novel III-V photonic materials using molecular beam epitaxy (MBE), and the development of application tailored optoelectronic devices. His approach to research targets ambitious goals with long-term potential for high societal impact. In terms of optoelectronic materials, his work concerning epitaxy of highly mismatched III-V alloys, such as GaInNAsSb and GaAsBi, is recognized as a leading effort in Europe. Other areas of excellence in material science and technology include advanced epitaxy of quantum dots and nanowires. Example of device-focused projects: development of multi-junction solar cells with 50% efficiency (ERC AdG), development of high power disk lasers for quantum technology (Academy of Finland), development of high-power eye safe laser diodes for LIDAR (H2020), and development of light sources and modulators for photonic integrated circuits (H2020). Leading system-level applications target the deployment of novel lasers in dermatology and ophthalmology.

Top 5 achievements

• Recipient of ERC AdG “AMETIST” for developing high efficiency lattice matched solar cells with more than 4 junctions (leading European development in the field);
• Author of over 170 journal publications, 5 book chapters, 4 granted patents;
• Supervisor of 15 PhD students (8 theses completed; two to be completed in 2018); proved excellence in education through 5 student prizes at international conferences and three national awards for PhD theses in the field of photonics and technology;
• Prizes: "Excellence in Research", awarded with the occasion of the 50th anniversary of the TUT (2015); "Distinguished Researcher" – Industrial Research Fund (2015);
• Co-founder of 3 start-ups commercializing results of research activities: ReflectKron Oy (founded in 2005, results of PhD studies), Picophotonics Oy (founded in 2015, result of TEKES project), Vexlum Oy (founded in 2017, work initiated as postdoc).

Main positions of trust

Topical Editor for Optics Letters and Journal of the European Optical Society; Senior Member OSA (since 2016), Senior Member SPIE (since 2015); Founder and Director of the International Summer School “New Frontiers in Optical Technologies”, established in 2001 (http://www.tut.fi/summerschool);
Committee member of more than 20 international conferences, e.g. The International MBE conference (ICMBE); The European Molecular Beam Epitaxy Workshop; The European Optical Communication Conference (2017/2018); Photonics West.

Selected publications

• E. S. Koivusalo, T.V. Hakkarainen, M. Guina, V.G. Dubrovskii; “Sub-Poissonian narrowing of length distributions realized in Ga-catalyzed GaAs nanowires”; Nano Letters 17, 9, 5350 (2017)
Mission statement
My ambition is to develop new and competitive sustainable technology. Ideally, I would like to combine my competence in the areas of advanced process control and optimization to the energy technology.

Research interests
My research covers power plant and combustion technology. I am experienced in industrial product development and I have accumulated experience in several industrial processes and research communities. In addition, does research in biofuels production (liquefaction), combustion technology, biotechnology and advanced process control and optimization. Furthermore, he has an extensive history in industrial product development and innovations.

Top 5 achievements
- Development of lime kiln optimization
- Development of fluidized bed boiler optimization
- Valmet’s new wood dust combustion solution
- Building of the HTL liquefaction test facility at TUT
- 3 patents, including calorific value compensator.

Selected publications
- Advanced controls - fuzzy logic for fluidized bed boiler, AT&P journal 2008, pp. 24-28, ISSN 1336-5010
- Steam Exploded Pellets for Heat and Power Generator, VGB Powertech 4/2016
Mission statement
Revolutions wherever mathematics is needed.

Research interests
I develop well-founded mathematical theory and methods for important open problems, especially in fields of research where mathematical analysis and expertise is necessary for breakthroughs.
I conduct original research in applied mathematics and mathematical modelling with theory and applications in several fields of science:
• Inverse problems, surface reconstruction, multimodal data
• Ecological and biological studies, forest sciences, biomathematics
• Space research, models of small solar system bodies
• Theoretical and mathematical physics, dynamical systems, Hamiltonian systems
• Remote sensing, light scattering: vegetation, snow, ice, natural surfaces

Top 5 achievements
• Introduction and development of the mathematical theory of generalized projections, with many applications in mathematical modelling in space research (first asteroid models from various types of data, incl. the discovery of the effect of sunlight on asteroid rotation)
• Several uniqueness and stability theorems on inverse problems; first well-defined solution of inverse problems of multiple data sources
• Efficient numerical solution of the Minkowski problem; geometric software
• Development of first accurate data-based 3D and 4D tree models; numerous ecological and biological applications
• General construction methods for invariant phase-space manifolds of dynamical systems

Main positions of trust
Vice director of the Centre of Excellence in inverse problems research (inverse modelling and imaging from 2018)
Various university councils and research project boards and steering groups

Selected publications
• M. Kaasalainen et al. (2007): Acceleration of the rotation of asteroid 1862 Apollo by radiation torques. Nature, 446, 420
• M. Kaasalainen (2011): Multimodal inverse problems: maximum compatibility estimate and shape reconstruction. Inverse Problems and Imaging, 5, 37
• M. Viikinkoski, J. Hanus, M. Kaasalainen et al. (2017): Adaptive optics and lightcurve data of asteroids: twenty shape models and information content analysis. Astronomy and Astrophysics, 607, A117
Mission statement
Our mission is to optimize nonlinear optical responses of nanostructured materials. In particular, we are interested in understanding how the intrinsic nonlinearities of various materials can be efficiently transferred to higher structural levels, including nanoparticles and their ensembles, leading to strong effective responses.

Research interests
Our research interests include the following complementary topics:

- Multipolar (dipolar, magnetic, quadrupolar) origin of the intrinsic nonlinear responses of various materials
- Unambiguous separation of the surface and bulk contributions to the nonlinear responses of materials
- Development of polarization-based nonlinear optical techniques to address nonlinear responses of materials and their structural features
- Design of high-order polarization modes of laser beam to optimize the coupling of light to individual nanoparticles and their ensembles
- Use of interparticle interactions to enhance the effective nonlinear responses of macroscopic samples consisting of nanoparticles
- Application of nonlinear techniques to address structural properties of biological samples

Top 5 achievements
- Over 160 publications in international journals, H-index (WoS) 39, cited over 6500 times
- Over 100 invited talks at international conferences
- 2014 Knight, First Class, of the Order of the White Rose of Finland
- 2012 Fellow, The Optical Society (OSA)
- 2004 Vaisala Award in Physics, Finnish Academy of Science and Letters

Main positions of trust
2012 – Member of Board, Quantum Electronics and Optics Division, European Physical Society
2013 – Associate Editor, Optica, The Optical Society (OSA)
2008 – 2011 Associate Editor, Optics Express, Optical Society of America
2008 – 2011 General Chair, European Quantum Electronics Conference 2015

Selected publications
Facility of Natural Sciences

Mission statement
Conduct applied research in aerosol science and technology, support and initiate industrial activity within this area, and combine academic and industrial research to reach high scientific and societal impact.

Research interests
Aerosol particle measurement methods, vehicle emissions and emission reduction technologies, and atmospheric particle formation and characteristics:
• Developing and combining different real-time methods – electrical, optical, spectroscopic, and mass spectrometric – to measure key properties of aerosol particles and nano-clusters for research in different areas, such as emissions, air quality, atmospheric, and pharmaceutical
• Continue to build up the experimental capabilities to link emission measurements to measurements on atmospheric processing of aerosols
• Find out how emission sources produce nanoparticle aerosol and secondary aerosol, then find out ways to minimize these emissions, particularly through technological development

Top 5 achievements
• Leading the Aerosol Physics research at TUT from 2001. The unit has produced more than 200 peer reviewed scientific journal papers
• Starting the academia – industry collaboration in traffic emission related research at TUT
• Development of measurement concepts for real-time aerosol measurement instruments used in over 400 laboratories worldwide, both in academia and industry
• Founding member of Dekati Oy, and, as the CoB of that, of Liekki Oy (now nLight Finland Oy). These companies have employed people for more than 500 person-years
• Walter Ahlström Prize 2003, Finnish Engineering Award 2001

Main positions of trust
Member, Tenure Track Committee of Tampere University of Technology, 2011-
Board member, Aerosol Research Foundation, 2012-
Member, National Council, Institute for Atmospheric and Earth System Research, 2013-
Member, Academy of Finland, Research Council for Natural Sciences and Engineering, 2017-2018

Selected publications
• Rönkkö, T., et al. Traffic is a major source of atmospheric nanocluster aerosol, PNAS., 114, 29, 7549-7554, 2017
Mission statement
My mission is to develop, characterize and optimize biological and bioelectrochemical processes for resource recovery from side and waste streams. This requires collaboration with academics from different fields, municipalities and industry.

Research interests
My research focuses on biotechnological processes aiming at recovering or producing value added compounds and renewable energy carriers. The focus is both on fundamental research for developing new knowledge on biological phenomena and bioprocesses as well as on application-oriented research by studying various waste streams.

My research interests include:
• Bioelectrochemical systems, including bioelectrochemical nutrient recovery, microbial electrosynthesis for carbon dioxide recovery, and microbial fuel cells for wastewater treatment
• Anaerobic digestion for nutrient and energy recovery
• Dark fermentation for the production of hydrogen
• Microalgal biomass production for nutrient recovery
• Molecular biology methods

Top 5 achievements
• Development of study module for Circular Economy in 2018 in multidisciplinary collaboration inside TUT
• Participant at the Global Young Scientists Summit 2017

Main positions of trust
Member of the Doctoral programme committee of the Faculty of Natural Sciences, 2013-2014
Reviewer for a Finnish foundation, 2018
Steering group member in two projects, 2017-

Selected publications
Mission statement

I would appreciate to have made my contribution in saving the world.

Research interests

Biorefining via thermochemical conversion of solid fuels (gasification, pyrolysis, hydrothermal liquefaction, combustion and related environmental technologies), hybrid energy production in distributed scale (solid biofuels, biogas, liquid biofuels, solar). Chemical process engineering, research & development & design, modelling and simulation of chemical processes, experimental research of processes in different scales (from laboratory to commercial scale), preparation of research & development projects, their accomplishment and coordination.

Top 5 achievements

Industrial:

- 1994-1995: Successful design and pilot-scale demonstration of an innovative environmental technology, regenerative sulfur removal process. The project was in cooperation with the US Department of Energy (DOE).
- 2004-2006: Successful process design related with the 30MWth wood gasification-based combined heat and power (CHP) plant located in Skive, Denmark.

Academic:

- Supervisor/Instructor of Academic Dissertations, including the latest by D.Sc. Tiina Keipi (2017) named "Technology Development and Techno-Economic Analysis of Hydrogen Production by Thermal Decomposition of Methane", which was accepted with honors.
- Supervisor of 30 Master’s Theses at Tampere University of Technology (TUT), University of Jyväskylä (JYU), Åbo Akademi University (ÅAU) and Helsinki University of Technology (HUT), most of them related with industrial cooperation by private companies.
- Teaching activities at 3 universities (TUT, JYU., ÅAU) and 3 universities of applied sciences (TAMK, HAMK, JAMK). Adjunct Professor/Docent at TUT (2006-2014).

Main positions of trust

Publication Forum panelist, Federation of Finnish Learned Societies, 2018 - 2022

Board of Finnish Flame Research Committee (FFRC) (member organization of International Flame Research Foundation (IFRF)), 2011-2012

Board of Doctoral program in Energy Efficiency and Systems 2011- 2015

Selected publications

Mission statement
I am a chemistry professor with a background in both chemical and pharmaceutical research. I have been interested in many things, but the interface between life sciences, especially pharmaceutical research, and chemistry has been scientifically fruitful and holds a special place for me. But most of all, I am interested with working with people.

Research interests
My research interests are broad, ranging from physical chemistry and electrochemistry to pharmaceutical technology and biomaterials. The current active topics in my group are related to three main categories:

- Bio- and nanomaterials such as cellulose nanofibers or metallic nanoparticles
- Use of new tools to track to analyze drug molecules and carriers
- Tailored materials for pharmaceutical applications, including drug formulation and controlled release systems

My past topics and expertise also include:

- Electrochemistry (liquid|liquid, nanoparticles, iontophoresis)
- Numerical modeling of mass transport and reaction kinetics

The experimental methodology that we have used includes e.g. characterization of materials (SEM, TEM, AFM, FTIR, Raman, DSC, TGA, etc.), cells (viability, tracking, imagining), electrochemistry (CV, DSV), and other analytics (UV-vis, (U)HPLC, fluorescence, etc.)

Top 5 achievements
- High-level publications (as of 2/2018: 70 publications, h-index 32)
- Demonstration of the use of nanocellulose in controlled drug release applications and relevant publications on photo-activated, iontophoretic, and diffusion-controlled drug release mechanisms
- Academy Research Fellow, 2012-2018
- Awards for the best chemistry doctoral thesis (Komppa palkinto), and a Young Researcher Award by the Faculty of Pharmacy, University of Helsinki
- Teaching in three different Finnish universities, supervision of Master’s/Doctoral thesis students from many universities in Finland and abroad

Selected publications
Faculty of Natural Sciences

Mission statement
My mission is to promote the transition of modern society towards circular economy for the benefit of the people and the environment by developing novel solutions and processes for metal, nutrient and carbon dioxide recovery, biological waste to energy conversion and sustainable wastewater treatment.

Research interests
My research focuses on environmental and industrial biotechnology, and bioprocess engineering. My specific research interests include:

- Microalgal cultivation integrated to nutrient recovery and/or production of fuels and value added chemicals
- Anaerobic processes for waste and wastewater treatment including
  - Autotrophic denitrification
  - Sulfate reduction
  - Dark fermentation for hydrogen production
- Bioelectrochemical systems (special focus on extremophiles and/or metal recovery)
- Tank, heap and in situ bioleaching of low-grade ores and metal-rich waste materials
- Characterization of microbial communities in natural and engineered systems using molecular biology methods

Top 5 achievements

- Two peer-reviewed scientific articles (Butti et al. 2016, Renew. Sust. Energ. Rev. 53: 462-476; Zou et al. 2016, Chem. Eng. J. 284: 1287-1294) classified as highly cited papers by Web of Science (received enough citations to place in the top 1% of the academic field of Engineering based on a highly cited threshold for the field and publication year as of September/October 2017).
- One of the key administrative and supervisory persons in Finland’s first European joint doctoral degree Marie Sklodowska-Curie ITN programme, ABWET, from the proposal stage to the realization of the project.
- Merit Prize of Oral Session, The 2012 Asian Biohydrogen and Bioproducts Symposium.
- Significant role in establishment of a new research focus area at TUT on microalgal biomass production and utilization including the setting up of required cultivation and analytical facilities since 2007.

Main positions of trust
Remote peer reviewer of funding applications for Research Foundation - Flanders (Belgium) and Technology Foundation STW (the Netherlands) in 2016.
Member of the Doctoral programme committee of the Faculty of Natural Sciences, 8/2014 – 12/2016.

Selected publications


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Asst. Prof. Aino-Maija Lakaniemi
ORCID: 0000-0001-7189-8741
TUTCRIS Portal, LinkedIn
Assistant Professor (tenure track), Bio and Circular Economy since 12/2016

Research career
- Docent in Environmental Biotechnology, TUT, since 7/2016
- Visiting Scientist, CSIRO Land and Water, Australia, 6/2017-4/2018
- Postdoctoral researcher, TUT, 2012-2016
- D.Sc. (Tech), TUT, 2012
- Researcher, TUT, 2007-2012
- Visiting PhD student, Bangor University, UK, 11/2009-12/2009

Funding
Academy of Finland: SEXUM and Biome-MAT
European commission Horizon 2020: ABWET and BIOMOre

Contact information
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Korkeakoulunkatu 8
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Mission statement

My key research question is how to generate novel functional materials with improved properties but with less amount of materials, utilizing aerosol nanoparticle techniques. My present research work focuses on generation and characterization of nanoparticle aerosols & nanopowders and fabricating functional coatings using aerosol methods.

Research interests

Aerosol formation and deposition processes in atmosphere and in industrial processes

Methods: Nanomaterial synthesis, Liquid Flame Spray (LFS), Flame Spray Pyrolysis (FSP), Tube furnaces, Aerosol Flow chambers, Aerosol measurement techniques

Applications: Multicomponent nanoparticle tailoring, Surface functionalization, Water repellency/Wetting, Omniphobic, Antimicrobial, Photocatalytic, Anti-icing, Porous thin films, Functional coatings, Plasmon resonance, Glass colouring, …

Top 5 achievements

• The Finnish Association for Aerosol Research: The Finnish Aerosol Award for experimental work in aerosol science, 1995
• Field measurements of ambient aerosol, first observations of new particle formation (NPF) in the atmosphere and role of amine compounds in NPF (1997-2000)
• Leader of Aerosol Synthesis Group at TUT since 2000, focusing on nanoparticle generation and fabrication of functional surfaces via aerosol synthesis.
• “NOSA Aerosologist” Award 2011, given by Nordic Society for Aerosol Research
• “Lecturer of the year, 2013” Award given by the Student Union at TUT.

Main positions of trust

Memberships and positions of trust in scientific and scholarly societies:

• The Finnish Physical Society, 1985 -
• The Finnish Association for Aerosol Research, 1985 - (Board member 1992, 1994-)
• The Gesellschaft fur Aerosolforschung, 1988 -1996,
• American Association for Aerosol Research, 1990-

Editorial board membership:

• Report series in Aerosol Science, 1992-
• Member of Editorial Advisory Board of Aerosol Science and Technology 1999- 2005
• Member of the Monitoring Group for the Nanosafety Research Centre at Finnish Institute of Occupational Health, 2011-2015

Co-organizer of the scientific conferences:

• European Aerosol Conference, Helsinki, September, 1995
• International Conference on Nucleation and Atmospheric Aerosols, Helsinki 1996
• Technical Program Committee of International Aerosol Conference, Helsinki, 2010
• Conference chairman for Nordic Aerosol Symposium, Tampere, 2011
• Conference chairman for Aerosol Technology Conference AT2015 Tampere, 2015

Selected publications

Mission statement
My mission is to investigate new methods to create nanostructures, characterize their optical and electrical properties and find industrial applications.

Research interests
Development of technology requires multidisciplinary approach. Understanding of the fundamental phenomena as well as experimental constrains are of utmost importance in designing and realizing novel optical structures and components. While electromagnetism and numerical modeling are both important and intriguing in nanophotonics my true passion is experimental work: realizing fabrication and characterization setups. My research group has few key areas.

Nanolithography
• Directed self-assembly of block copolymers
• Nanoimprint lithography
• Electron-beam- and photolithography

Materials processing, characterization and applications
• Materials processing by high-power fiber lasers
• Photonics nanostructures
• Nanomaterials (nanoparticles and -wires, upconversion nanoparticles)

Top achievements
~45 articles in peer reviewed journals.

Electron-beam lithography
Directed-self assembly

Main positions of trust
Member of Optical Society of America, Phototonics Finland, Materials Research Society
Chairman of CLEO Europe in “Micro- and nanophotonics”

Selected publications
Faculty of Natural Sciences

Asst. Prof.
Lassi Paunonen

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sysgrouptampere.wordpress.com/
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TUTCRIS Portal, ArXiv.org page

Assistant Professor (Tenure Track) in Mathematics, since July 2016.
Leader of the Systems Theory Research Group

Research career
• Postdoctoral researcher, TUT, 2012-2016.
• Academic visitor at Oxford University 1-7/2017
• PhD in Mathematics at TUT, 2011
• Visiting PhD student at University of Twente, The Netherlands, 3-9/2011

Funding
Coordinator of an Academy of Finland project 2017-2021
Academy of Finland Postdoctoral Research Fellow 2016-2019
Coordinator of a Ministry of Education Asia Programme project 2016-2018

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Mission statement
My research utilizes advanced and modern mathematical methods in the study of models arising from a wide range of engineering and industrial applications.

Research interests
My area of expertise is the analysis and control of mathematical models described by differential equations. My research ranges from theoretical topics in Functional Analysis and Operator Theory to the employment of these methods in Control of Dynamical Systems, especially those described by Partial Differential Equations. Our research group focuses on “robust” control solutions which tolerate uncertainty, measurement errors, as well as changes in the model parameters.

Some of our current main research topics are listed in the following:
• Robust control of Partial Differential Equations, especially those describing diffusion and flows, waves and vibrations, and behaviour of flexible structures.
• Dynamics of vehicle platoons and large groups of autonomous agents, such as long queues of self-driving cars or groups of robots.
• Stability theory of abstract linear differential equations on infinite-dimensional vector spaces and the theory of strongly continuous semigroups of operators.
• Applications of mathematical systems theory in computational neuroscience, especially in the analysis of nonlinear dynamical models.
• Biomedical applications of robust tracking control.

Top achievements
Author of 25 articles in high-quality journals and 19 peer-reviewed papers in international conferences (h-index 6).

Main research contributions:
• Advancement of the theory of internal model based robust control and development of novel robust controller design methods in a series of articles.
• Study of the characteristic dynamical behaviour of long vehicle platoons.
• A number of research contributions in topics related to stability and large-time behaviour of models describing damped vibrations.

Coordinator of the Academy of Finland project “Robust Control of Distributed Parameter Systems” (2017-2020).

Main positions of trust
Member of the IEEE Technical Committee on Distributed Parameter Systems.
Member of the Steering Committee of the conference “Control of Distributed Parameter Systems”.
Member of SIAM (Society of Industrial and Applied Mathematics) and the IEEE.

Selected publications
Mission statement
We conduct research on the preparation and characterization of specialty photonic glasses, mainly laser glasses. We focus the research on understanding composition-structure-property relationship in these materials, with the goal to tailor new compositions to suit specific applications.

Research interests
Active glasses and glass fibers / thin films  
Active Glass-ceramics (GCs)  
Active hybrid glasses using the direct particles doping method  
Persistent luminescent glasses  
Glasses for Mid-IR applications

Top 5 achievements
• Publications: 114, h index: 23
• Development of glasses with 3D persistent luminescence suitable for radiation detection as well as sensing for structural damage, fracture of materials and temperature
• Research Grant: Academy of Finland, ATLANTIS, 2017-2021
• Co-Chair of 7th International Workshop on photoluminescence in rare earths: photonic materials and devices (PRE’17) (Italy), 30 Nov. - 2 Dec. 2017
• 2 patents on Tapered Core Fiber Manufacturing Methods & Glassy Surface Smoothing Layer for Integrated Waveguide

Main positions of trust
• Member of OSA (Optical Society of America) and Lifetime Member of ACerS (the American Ceramic Society)
• Member of the Technical Committee 20 (TC20, glasses for optoelectronics and photonics applications) in the International Commission on Glass (ICG) & American Ceramic Society
• Member of the Management Committee of COST Action MP1401
• Guest Editor: Special Issue in Optical Materials (PRE’17), Rare-Earth Doping for Optical Applications Special issue in Applied Sciences & Mid-IR Photonics Special issue in Optical Materials Express (2018)

Selected publications
• H. Nguyen et al, Upconversion in low rare-earth concentrated phosphate glasses using direct NaYF₄: Er³⁺, Yb³⁺ particles doping, Scripta Materialia, 139 (2017) 130–133
Research career

• International Research Fellow at Politecnico di Milano, Italy
• JSPS Postdoctoral Fellow at Tokyo Institute of Technology, Japan
• Aalto University Postdoctoral Fellow
• PhD Helsinki University of Technology, 2009

Mission statement

I am intrigued by functional soft materials whose properties can be controlled by external stimuli. Why? Because of (i) scientific curiosity, and (ii) the belief that the disruptive technologies of tomorrow are ultimately driven by the development of advanced and creative materials concepts.

Research interests

The research activities of the SPM group combine chemistry and physics, both equally important in developing new functional materials. We work on Functional Supramolecules, i.e., materials in which self-assembly via specific intermolecular interactions brings about new properties that can be further utilized in e.g. organic electronics. Our second core area is Soft-Matter Photonics, where we study several fascinating topics ranging from light-fuelled robotics to tunable lasers. A friend and companion that enables us to reach our goals is the small but powerful photoswitchable azobenzene molecule.

Top 5 achievements

- Gathering an excellent research team, full of motivated and bright minds that are willing to combine their strengths
- Taking the courage to live and work in Japan, which was an invaluable experience both professionally (thanks to Prof. Atsushi Shishido) and personally (thanks to the life-long friendships made)
- Outstanding Doctoral Dissertation Award, by the Finnish Academy of Science and Letters, made me feel that I did something right during my PhD work
- Lastly and most importantly; raising two lovely and talented kids, who love me despite the fact that I work too much 😊

Main positions of trust

Having the privilege of chairing the 3rd International Conference on Photoalignment and Photopatterning in Soft Materials in Tampere in June 2018; acting as a peer reviewer for > 50 international scientific journals; contributing to the development of TUT research infrastructure as a board member of the TUT Microscopy Center.

Selected publications

Mission statement
My main interest is in fundamental and applied research and development for sustainable environmental and industrial management and solutions. The R&D focuses on open, large-scale bioprocesses. The research is often conducted with industrial partners to promote practical applications.

Research interests
Over 25 years of experience in national and international research programs with the industry and academic partners in the field of industrial and environmental engineering and often as the principal investigator. Specific research interests: bioremediation, biological treatment, bioprocesses for energy harvesting, mining biotechnology, microbiology and microbial ecology of extreme environments
Supervised 28 doctoral and over 130 MSc graduates. Over 200 publications in peer reviewed periodicals (Citations in WoS over 4500, and Scopus over 4850)

Top 5 achievements
• Tapani Järvinen’s Environmental Technology Award 2104
• Pirkanmaa Environment Prize for research of the Institute of Environmental Engineering and Biotechnology, TUT 2006
• The International Water Academy membership 2000
• Annual Literature Prize of Water Association 1994
• Commercialized bioprocesses for environmental engineering and process biotechnology

Main positions of trust
Member of Editorial Board, Energies (Journal) 2018-
Member of Editorial Board, Environmental Research & Technology (Journal) 2018-
Chairman of the Board for the Joensuu UniversityFoundation 2015-2017
Chairman of the Committee for the Teollisuusneuvos Väänänen’s Fund 2015-2017
Member of the Board for Joensuu Science Park 2015-2017
Member of the Board for Kuopio Innovation Ltd 2015-2016
Chairman of the Board for the Institute of Biosciences and Medical Technology; Univ. Tampere and TUT 2014
Chair of the Doctoral Program Committee for Engineering and Natural Sciences, TUT 2012-2013
Representative of Fionland in International Energy Agency Expert Group (Annex 21, Biohydrogen 2008-2013
Member of the Board of Directors for Environmental Engineering Curriculum development at Murmansk University of Technology 2004-2007
Chair of the Committee for Biotechnology Program development at TUT, 2003-2004

Selected publications
• AM Lakaniemi, CJ Hulatt, DN Thomas, JA Puhakka 2011. Biogenic hydrogen and methane production from Chlorella vulgaris and Dunaliella tertiolecta biomass. Biotechnology for Biofuels 4: 34
Mission statement
My research concentrates on advancing the mathematical and computational methodology in the imaging applications of life and geosciences, where highly advanced technological applications often comprise incomplete data and scarce a priori information leading to ill-posed inverse problems. Characteristic to inverse imaging is that the quality of the results depends also on various other factors such as the applied measurement approach and mathematical methodology. Owing to the recent rapid increase in computational resources and the ability to handle massive amounts of data, the number of numerically approachable problems is growing constantly.

Research interests
I focus on developing mathematical methods for 3D imaging applications involving electromagnetic signals and sparsity of measurements. An important research goal is, for example, to advance finite element method (FEM) based computations in electro- and magnetoencephalography (EEG/MEG) source analysis and transcranial electrical stimulation (tES) of the human somatosensory network. The FEM is currently a vital tool in realistic modelling of the electromagnetic fields of the brain as it can be optimized precisely to a given volumetric head geometry taking into account accurate skull representations, cerebrospinal fluid, the brain’s internal folded surfaces and anisotropic tissue structures. In brain related research, I have a long-term collaboration relationship with the Institute of Biomagnetism and Biosignal Analysis, University of Münster. Currently, I also investigate computational full-wave radar tomography methods with penetrating spaceborne radar imaging of small solar system bodies (SSSBs) as a potential application. Gaining more knowledge of SSSBs is a central objective of the future planetary research for their exceptional role in the solar system for their large number and orbits that can cross that of Earth. Inversion mathematics is widely needed in exploration of SSSBs, since only limited data are available. In planetary science, my main international collaboration is with the Max Planck Institute for Solar System Research, Göttingen.

Top 5 achievements
• Team leader, Centre of Excellence in Inverse Modelling and Imaging 2018-2025, Academy of Finland.
• Principal Investigator, Academy of Finland Key Project 2016-2018: High- and low-frequency inverse imaging.
• Science team member, Deep Interior Scanning CubeSat (DISCUS) project led by Max Planck Institute for Solar System Research.
• Postdoctoral Researcher, Academy of Finland, 2012-2015.

Main positions of trust
Member in the Finnish Inverse Problems Society (FIPS).
Member in the Finnish Mathematical Society.

Selected publications
Mission statement

Materials are the most important premise for engineering technology. We develop and use electronic structure calculation methods and other modelling approaches for materials physics, the fundamental tools for understanding materials properties and development of better and new materials. Education and training is an intrinsic part of our research.

Research interests

Light–matter interaction and quantum technology define the framework of our research interests. Photovoltaics, semiconductors and their interfaces, heterogeneous catalysis and quantum nanostructures are typical examples of the functional materials and related phenomena we work on.

The latest research targets are related to solar cells, atomic clusters, quantum dots and adsorbate–surface interaction. Qubit control and dynamics is under consideration.

We develop quantum simulation methods based on the Feynman path integral approach and its computational implementations. Fermion sign problem is one of the grand challenges we face with Quantum Monte Carlo methods. With our novel numerical real-time path integral approach we aim at relieving this problem in practical calculations and simulations of many-body systems.

The latest developments have directed to finite-temperature quantum mechanics, exact correlations, external fields and hyperpolarizabilities, and real-time path integral methods.

Top 5 achievements

• The first ever first-principles simulation of a chemical reaction (Kylänpää et al.).
• The first ever real-time path integral approach for simulation of electrons (Ruokosenmäki et al.).
• Exchange functional GLLB-SC for band gap materials (Kuisma et al.) and working schemes to find electronic structures of semiconductor defects (Komsa et al.).
• Finite temperature simulation of quantum dot cellular automata (Tiihonen et al.).
• Qualification and competence to the posts of Professor of Atomic and Molecular Physics at the University of Oulu (2000), Associate professor in Biophysics at the University of Oulu (1998), Professor in Physical Chemistry at the University of Oulu (1996), and Associate Professor in Technical Physics, Quantum Mechanics in particular at the Helsinki University of Technology (1989).

Main positions of trust

• 1980– Member of Finnish Physical Society
  2001–2003 Vice president
  2003–2005 President
• 1986– Member of European Physical Society
• 1990– Member of American Physical Society
• 1990– Member of Finnish Chemical Society
• 2004– Member of Institute of Physics (UK)
• 2012– Associate Editor of Physica Scripta

Selected publications

• Mikael Kuisma et al., Kohn–Sham potential with discontinuity for band gap materials — Physical Review B 82, 115106 (2010).
Mission statement

My main mission is to develop sustainable environmental technologies for wastewater and waste management in order to reduce environmental impacts and to promote the efficient use of natural resources.

Research interests

I am interested in developing both the environmental technologies as well as their integration in urban and industrial material flow systems. My research interest includes e.g. biogas processes and systems, biomethane production, nutrient circulation, methane oxidation and landfill mining. I am interested in further study different feedstocks such as municipal wastes as well as food and pulp and paper industry wastewaters and sludges. Furthermore, I am eager to develop urban circular economy and sustainable residential districts in multidisciplinary research and stakeholders' networks.

Top 5 achievements

- Multidisciplinary research and scientific publications with colleagues e.g. in the fields of ecotoxicity, agriculture, and social sciences.
- Capacity building through supervising more than 20 PhDs in the field of environmental engineering.
- Chairing MSc programs in Environmental Science and Technology (Jyväskylä University, 2007-2011) and Environmental and Energy Engineering (Tampere University of Technology, 2012 onwards).
- Work in bioenergy (biogas) sector has been awarded by the Finnish association for biological waste treatment (2016) and by the Finnish Bioenergy Association (2008).
- Knight, First Class, of the Order of the White Rose of Finland, 2016. For work at Tampere University of Technology.

Main positions of trust

Chair of the working group on “Long term scenarios on utilisation of biomass in Finland” nominated by the Ministry of the Trade and Industry (2006-2007).

Selected publications

Mission statement
My passion is to master computational physics to solve complex multidisciplinary challenges ranging from quantum mechanics to health diagnostics.

Research interests
Quantum mechanics, nanotechnology, and condensed matter & material physics. Examples: quantum dots, semiconductors, quantum transport, quantum Hall systems, graphene and other low-dimensional lattices.
Atomic physics and strong-field dynamics. Examples: optimal control theory, high-harmonic generation, ionization processes, Rydberg states, nanophotonics.
Classical and quantum chaos and nonlinear phenomena. Examples: quantum scarring, billiard systems, diffusion and avalanches.
Numerical methods, algorithms, and machine learning in computational physics.
Time-series analysis of complex signals. Examples: heartbeat variations and ECG analysis, financial data and econometrics, rhythmic fluctuations in music.

Top 5 achievements
• More than 110 refereed journal articles in physics including diverse subfields.
• More than 50 invited talks in international conferences, schools, and colloquia.
• Nominated as an Associate of Harvard University, USA, 2013.
• Outstanding Referee, European Physical Journal, 2013.
• Awarded as a “LUMA Ambassador” in 2017 for significant contributions to the Finnish STEM education and scientific outreach.

Main positions of trust
Vice Dean for Education, Faculty of Natural Sciences, TUT, 2017-
Board Member, Finnish Physical Society, 2016-
Director and Chair of the Board, Tampere LUMATE Centre, 2015-2017
Member (2015-17), Vice Chair (2016-17), and Chair (2017) of National LUMA Board
Expert for European Commission in H2020 (ITN, ICT, MSCA, etc.), 2015-
Director of the International B.Sc. Program in Science and Engineering, TUT, 2015-
Vice Member of the Science Council, TUT, 2014-
Committee member of the Finnish Matriculation Examination in Physics, 2013-
Management committee member of two COST Actions, 2009-2016
Research Team Leader, European Theoretical Spectroscopy Facility, 2008-

Selected publications
• S. Paavilainen et al., Co-existing honeycomb and Kagome characteristics in the electronic band structure of molecular graphene, Nano Letters 16, 3519 (2016)
• P. J. J. Luukko, et al., Strong quantum scarring by local impurities, Scientific Reports 6, 37656 (2016)
• J. Kuusela et al., The effects of pharmacological compounds on beat rate variations in human long QT-syndrome cardiomyocytes, Stem Cell Reviews and Reports 12, 698 (2016)
Mission statement

My mission is to harness the power of biology to build factories run by bacteria. By reprogramming bacteria and their interactions we can create new sustainable production platforms and improve existing ones for the benefits of society.

Research interests

In nature, the interactions between bacteria allow them to distribute work load and run parallel tasks simultaneously. This cooperation will eventually lead to more efficient output in terms of energy and carbon units utilized in the overall process.

My main research interests are:

- how novel synthetic interactions can be constructed for bacterial cell factories
- how these interactions can be utilized for the construction of functional synthetic microbial consortia
- how these consortia can be applied in the context of sustainable production.

For example, the current bioproduction platforms are solely based on the utilization of sugar fractions of lignocellulose, leaving the lignin fraction underutilized. In nature, several microorganisms work in a synergistic manner, efficiently utilizing all the lignocellulosic material. In my current projects, we are developing novel biological pathways for the valorization of lignin and improving the systems by genome level metabolic engineering.

Robust and context-independent components are necessary elements for an efficient design of biological systems. In the nascent field of synthetic biology, the construction and characterization of the components constitute the core of the field. We are working with soil bacteria and a lot of my research activities are dealing with the construction of functional genetic circuits and optimization of the engineered systems in order to minimize metabolic burden.

Keywords: bacterial cell factory, synthetic biology, metabolic engineering, genetic circuits, soil bacteria, synthetic bacterial consortia, lignin valorization, industrial biotechnology

Top achievements

- Long chain alkyl ester production from CO2 and electricity by a bacterial system
- De novo synthesis of drop-in liquid traffic fuels by engineered bacteria
- Proof-of-principle demonstrations how rationally engineered synthetic bacterial cocultures can be utilized to improve production
- Biological modification of the properties of long chain alkyl esters by metabolic rewiring

Selected publications

- Lehtinen et al. (2017) Production of Long Chain Alkyl Esters from Carbon Dioxide and Electricity by a Two-Stage Bacterial Process. Bioresource Technology, 243:30-6
- Kannisto et al. (2015) Metabolic engineering of Acinetobacter baylyi ADP1 for removal of Clostridium butyricum growth inhibitors produced from lignocellulosic hydrolysates. Biotechnology for Biofuels. 8:198
Mission statement
We do our studies to find how electronic properties of materials can be controlled by light, and used for further exploitation. Our mission starts from learning basics, and turning it to an application, such as new ideas for solar cell and water splitting devices.

Research interests
We are interested in a wider range of phenomena dealing with light-matter interaction and design of hybrid nanostructures with specific response to photoexcitation. At materials chemistry we search for new design pattern for hybrid organic-inorganic nanostructures (e.g. quantum dots, nanowires, etc) to gain new photonic properties. At the experimental level we are very skillful in conducting fine optical spectroscopy studies of complex system, especially using ultrafast spectroscopy of systems with low response intensities. At the fundamental scientific level we study mechanisms and dynamics of photo-reactions, including charge separation and photo-carrier transport and migration, exciplex mediation, singlet state fission, etc, in complex molecules, molecular assemblies and organic-semiconductor hybrids.

Top achievements
• Study of the exciplex role in photoinduced electron transfer in highly coupled donor-acceptor systems.
• A series of studies on vectorial charge transfer in molecular films.
• Quantitative analysis of photoinduced electronic interactions in molecules, molecular aggregates and organic-semiconductor nanohybrids.

Main positions of trust
Local representative in International Society Porphyrins and Phthalocyanines
Member of Electrochemical Society and European Photochemistry Association
Member of Editorial Board of the International Journal of Photoenergy

Selected publications
Research career

- Tenure Track, 2015-, Tampere University of Technology
- Senior research fellow, 2007-2015, Tampere University of Technology
- Research visitor, 2006-2007, Max Planck Institute, Germany
- Postdoctoral researcher, 2003-2007, University of Turku
- PhD, 1999-2003, Aalto University

Funding

ULTRAPHOTOSTABLE, 2017-2021 (Academy of Finland)
SUPUVIR, 2016-2020 (EU ITN)
Industrial Graduate School, 2017-2020 (Vaisala, TUT)
NINS3, 2015-2019 (Business Finland)

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Mission statement

I want to bring modern optical spectroscopic tools available for industrial utilization e.g. in process control and safety applications. Optical spectroscopy allows fast and precise identification of trace molecules and impurities in gases, liquids, and solids, and the rapid development of photonic tools makes this technology accessible.

Research interests

We develop new methods for optical sensing of various substances including molecules in high-temperature combustion environment, radioactive materials e.g. at decommission sites, and trace impurities in water. Further, we develop lidar technology (laser radar) for short-range profiling of gas concentrations and temperature, and for long-range atmospheric pollution mapping. We also study new material systems activated with laser writing, which potentially can yield to controlled and very stable fluorescent nanoclusters for sensing and labeling applications.

Top 5 achievements

- New polymer material system for laser writing of fluorescent microstructures, ACS Nano + 4 other journal publications
- Remote sensing and imaging technology for radioactive materials, enables rapid and accurate localization of the radioactive materials, 6 journal publications
- New laser-based in-situ measurement technology for harmful alkali salts in biomass power plants and research reactors, 5 journal publications
- 4 patents plus 1 patent application together with Finnish companies, IPR transferred for commercialization
- Attracted in total 3.9 M€ external funding for the research group, supervised 6 PhD dissertations and 23 M.Sc. Thesis

Main positions of trust

Board member, Photonics Finland, 2017-
Board member, National Consortium for Radiation Safety Research, 2017-
Scientific committees: OIE’17, Northern Optics & Photonics 2018
Topical Editor, Optical Review, 2017

Selected publications

Mission statement
My passion is to study, understand and teach the rational and logical part of human thinking from a mathematical and formal point of view.

Research interests
Generalized and non-classical logics including many-valued logics, mathematical fuzzy logic, paraconsistent logics, logic based data mining, descriptive data mining, mathematical modelling by logic methods, algebraic logics. Real life applications of various logic methods.

Top 5 achievements
• Turunen, E.: Mathematics behind Fuzzy Logic. 1999 Heidelberg: Springer Verlag. 191 p. A selected textbook, used as teaching material at several universities.
• Best lecturer 1992 and 1997 awards given by the Student Association of Lappeenranta University of Technology
• Best net based teaching material 2004 - award given by Tampere University of Technology
• Research award (University's 50th Anniversary Gala), 2,000 EUR, Nov 2015, TUT.

Main positions of trust
Several memberships in editorial boards etc, including
• Mathematical Reviews (Publisher) Editorial board member
• Soft Computing (Journal) Editorial board member
• Information Sciences (Journal) Reviewer
• Fuzzy Sets and Systems (Journal) Reviewer
Several membership of a scientific or program committee of a conference, including
• 16th World Congress of the International-Fuzzy-Systems-Association (IFSA) / 9th Conference of the European-Society-for-Fuzzy-Logic-and-Technology (EUSFLAT)
• LANMR 2014 Ninth Latin American Workshop on Logic/Languages, Algorithms and New Methods of Reasoning 2014
• First International Conference on Algorithmic Decision Theory ADT 2009, October 21-23, 2009, Venice, Italy

Selected publications
Mission statement
We conduct research on phenomena at surfaces and interfaces of photonic materials, biomaterials, metal and semiconductor alloys and nanostructured materials. The main objective is to gain insight into the physicochemical surface and interface properties and to develop novel materials by functionalizing surfaces at the nanometer scale. I also share a great interest towards engineering pedagogy.

Research interests
Our research activities are focused on surface science studies relevant to applications ranging from corrosion to nanotechnology. In particular we are internationally renowned for our scientific expertise in electron spectroscopy. Currently we investigate artificial photosynthesis, where solar energy is converted into chemical energy through two photocatalytic charge transfer reactions: water dissociation into hydrogen and oxygen and carbon dioxide reduction into CO and carbohydrates. We are also investigating the molecular processes of atomic layer deposition (ALD) and how the ALD growth mechanism can be adjusted to control the thin film properties when the thin films are utilized in photonic materials and semiconductor nanomaterials. We are engaged with using synchrotron light mediated research methods in all our projects. In particular, we have access to MAX IV Laboratory, which is one of the newest and the strongest synchrotron radiation facilities in the world.

Top 5 achievements
• FIFI project “FinEstBeaMS” funded by Academy of Finland for design and construction of materials science beamline FinEstBeaMS at MAX IV Laboratory, 2011 – 2018
• FIFI project ”NanoMAT Laboratory” funded by Academy of Finland for synthesis and research of nanostructured photonic materials featuring spectromicroscopy and an ALD reactor (Atomic Layer Deposition), 2011 – 2015
• Scientific advisor of a spin-off company, SurfLab Solutions Oy for commercialization of our research expertise in surface and interface technologies, 2014 –
• Väisälä Award from the Finnish Academy of Science and Letters in 2011
• Academy Research Fellow, Academy of Finland, 1999 – 2004

Main positions of trust
Teacher Instructor for university teacher's pedagogical qualification in pedagogy and educational sciences at Tampere University of Applied Sciences and Tampere University of Technology.
Member of the Board of Directors of SurfLab Solutions Oy

Selected publications
Mission statement
Our primary objective is to promote health through scientific computing.

Research interests
The Vattulainen team focuses on computational biological sciences. The objective is to strengthen the understanding of biological processes on molecular and cellular levels to promote health. The research focuses on lipids, membrane proteins, lipid transfer proteins, signaling, tear films, drugs, and glycans. These research topics are related to outstanding issues such as cardiovascular disease, type 2 diabetes, dry eye syndrome, and cancer, as every one of these diseases concerns hundreds of millions of people on a daily basis. To this end, the team uses a major fraction of its resources to develop new simulation techniques for multiscale simulations, and novel methods for analyzing Big Data. All of our projects are bridged to experiments (Helsinki, Oxford, Dresden, Heidelberg, etc.) through collaborations.

Top 5 achievements
- Supervised ~20 PhD theses. Every one of these folks is now in an excellent position
- Published ~250 peer-reviewed articles, including > 30 in high-impact journals (Nature family, PNAS, PLoS Biology, Phys Rev X, Phys Rev Lett, JACS, JPCL, etc.)
- Center of Excellence granted by the Academy of Finland (2014–2019)
- Scientific Awards granted by, e.g., the Academy of Finland, the Magnus Ehrnrooth Foundation, and the Alfred Kordelin Foundation

Main positions of trust
Member of the Board, European Biophysical Societies’ Association (2011–)
Member, ERC evaluation panel (2014–)
Chair, Customer Panel of CSC – IT Center for Scientific Computing (2013–)

Selected publications