Marko Vauhkonen
University of Eastern Finland
Department of Technical Physics
P.O. Box 1627
FI-70211 Kuopio, Finland
Tel. +358 40 771 3737
E-mail: marko.vauhkonen@uef.fi
https://uefconnect.uef.fi/en/person/marko.vauhkonen/

CV

1. **Full name and date**
   - Vauhkonen
   - Marko Johannes
   - https://orcid.org/0000-0001-6454-852
   - 22.05.2025
2. **Education and degrees awarded**
   - Adjunct professorship (docent): Physics, University of Kuopio, 02.11.2000
   - Ph.D.: Physics, University of Kuopio, 30.05.1997, Thesis title: Electrical impedance tomography and prior information
   - M.Sc.: Physics, University of Kuopio, 01.09.1994
   - Matriculation: Varkaus, 31.05.1989
3. **Language skills**
   - Mother tongue: Finnish
   - Other languages: English (fluent), Swedish (moderate), German (basics)
4. **Current employment**
   - Professor (Industrial Physics and Mathematics), Department of Technical Physics, Kuopio Campus, University of Eastern Finland, Finland
5. **Previous work experience**

   University of Kuopio (UKU), Academy of Finland (AF), University of Eastern Finland (UEF), Research assistant/UKU, 01.09.1994-28.02.1995, Assistant/UKU, 01.03.1995-31.12.1995, Researcher/UKU, 01.01.1996-30.11.1997, Senior assistant/UKU, 01.12.1997-30.11.1998, Visiting scientist/Oxford Brookes Univ., 08.06.1998-08.10.1998, Post-doc researcher/AF, 01.12.1998-31.07.1999, Researcher/UKU, 01.08.1999-31.05.2000, Post-doc researcher/AF, 01.06.2000-31.08.2001, Research director/UKU, 01.09.2001-30.04.2008, Marie Curie Research Fellow, Philips Research Europe, Aachen, Germany, 01.05.2006-30.4.2008, Research director/UKU, 01.05.2008-31.5.2008, CTO at Numcore Ltd., 01.06.2008- 31.5.2009, CSO at Rocsole Ltd., (part time) 1.6.2012-31.12.2018
6. **Research funding**
   - Major research funding from 2015 onwards: EAKR project “Kehittynyt vesien käsittelyn pilotointiympäristö, KEVEYS”, 1.6.2014-30.4.2015, 63 720 €, EAKR project ”Kaivosvesiosaamisen verkosto, KaivosVV”, 1.1.2015-31.12.2017, 49 642 €, TEKES/EAKR project, VITOMIMO, 1.7.2015-30.6.2017, 302 000 €, Jenny and Antti Wihuri foundation, “Multiphase flow imaging in process industry”, 1.1.2016-31.12.2016, 32 000 €, Jane and Aatos Erkko foundation, “Functional 4D imaging in fMRI and PET”, 1.1.2017-31.12.2020,

434 000 €, Marie Skłodowska-Curie ITN, EU-project, "Smart tomographic sensors for advanced industrial process control", 1.9.2017-30.2.2022, 530 000 €, Centre of Excellence in Inverse Modelling and Imaging, Academy of Finland, 1.1.2018-31.12.2020, 118 109 €, CoE in Inverse Modelling and Imaging, Academy of Finland, 1.1.2021-31.12.2022, 135 286 €, CoE in Inverse Modelling and Imaging, Academy of Finland, 1.1.2023-31.12.2025, 200 505 €

7. **Research output**
   - Total number of publications: Scientific papers in peer reviewed journals: 128, Peer reviewed papers in conference proceedings: 68, h-index 45 (Google scholar)
   - Invention disclosures and patents: Total of 15 ID's, patents or patent applications at Philips, UEF, Numcore and Rocsole
   - Other commercialisation-related merits: Founder of two spin-off companies, Numcore Oy (2008, sold to Outotec Oyj in 2012) and Rocsole Oy (2012-). Board member of Numcore (2008-2012) and Rocsole (2012-2014), Board Member of Nostetta Oy (2020-)
8. **Research supervision and leadership experience**
   - **Ph.D. Jorma Ollikainen**, *Modelling and computational aspects in EEG inverse problems,* 2001, **Ph.D. Ville Kolehmainen**, *Novel approaches to image reconstruction in diffusion tomography,* 2001, **Ph.D. Päivi Vauhkonen**, *Image reconstruction in three-dimensional electrical impedance tomography,* 2004, **Ph.D. Lasse Heikkinen**, *Statistical estimation methods for electrical impedance tomography,* 2005, **Ph.D. Aku Seppänen**, *State estimation in process tomography,* 2005, **Ph.D. Tanja Tarvainen**, *Computational methods for light transport in optical tomography,* 2006, **Ph.D. Olli-Pekka Tossavainen**, *Shape estimation in electrical impedance tomography,* 2007, **Ph.D. Eeva Boman**, *Boltzmann transport equation in radiation therapy treatment planning,* 2007, **Ph.D. Janne Heikkilä**, *Models for elastography-based monitoring of focused ultrasound surgery and diagnostics*, 2011, **Ph.D. Ville Rimpiläinen**, *Electrical tomography imaging in pharmaceutical processes,* 2012, **Ph.D. Anssi Lehikoinen**, *Modeling uncertainties in process tomography and hydrogeophysics,* 2012, **Ph.D. Jari Kourunen**, *Imaging of mixing in selected industrial processes using electrical resistance tomography*, 2014, **Ph.D. Tuomas Koivumäki**, *The bioimpedance technique in respiratory- and dual-gated positron emission tomography imaging*, 2014, **Ph.D. Ph.D. Gerardo del Muro Gonzalez,** *Edge-promoting priors in electrical impedance tomography*, 2017, **Antti Voss,** *Imaging moisture flows in cement-based materials using electrical capacitance tomography*, 2020, **Ville-Veikko Wettenhovi,** *Image reconstruction in functional MRI and PET*, 2021, **Matti Kortelainen,** *Studies on accuracy and reliability of gated myocardial perfusion SPECT*, 2021, **Matti Hanhela,** *Image reconstruction in dynamic and quantitative MRI using undersampled data*, 2022, **Rahul Yadav,** *Neural network and Bayesian inversion methods for industrial process imaging using microwave tomography*, 2022, **Marzieh Hosseini,** *Moisture control in microwave drying process using electrical capacitance tomography*, 2023, **Ziaul Arif,** *Dual-modal electromagnetic tomography for two-phase flows*, 2024**, Janne Koponen,** *Novel deep learning methods in elastic imaging*, ongoing, **Mahnaz Khalili,** *Characterisation of water-saturated aquifers using seismic methods*, ongoing**, Ilmari Smedberg**, *3D modelling of aquifer characteristics with geophysical data*, ongoing, **Lyydia Meuronen**, *Machine learning surrogate modeling for risk assessment and water quality prediction at mining sites*, ongoing. **Mary Joy Erojo**, *Deep learning methods for enhancing quantitative cardiac imaging with novel digital 3D SPECT systems*, ongoing, **Niilo Saarlemo**, *Novel inverse problems methods for cardiac single photon computed emission tomography*, ongoing, **Fatemeh Maleki Almani**, *Computational Modelling, Optimization and Control in Industrial Processes*, ongoing. Several M.Sc. and B.Sc. students supervised since 1997.

9. Merits in teaching and pedagogical competence

- Involvement in curriculum planning: Part of the curriculum planning group since 2009. Head of the degree program of Applied Physics during 1.1.2014-31.1.209. Teaching experience: The following courses have been planned and lectured since 1997. Also lecture material written for most of the courses: Basics of physics, Introduction to applied physics studies, Physics laboratory course, Linear and matrix algebra, Mathematical methods in physics, Finite element methods, Estimation theory, Probability theory, Numerical methods
- Development of teaching methods: Member of the national network on Web-based courses in Mathematical modelling (https://hlab.ee.tut.fi/mallinnus). Web-based teaching technology has been developed in this project. Two to three web-based courses per year on Mathematical modelling given since 2003
- Doctoral program: Head of an UEF doctoral program "Mathematical analysis and scientific computing", 1.1.2013-31.12.2014, Board member of the doctoral program SCITECO, 1.1.2015-31.12.2017

10. Awards, prizes and honours

- Young Scientist of the City of Kuopio, 1997

11. Other academic merits

- Service as a pre-examiner or as an opponent of a doctoral dissertation, as a member in dissertation committees: **Jenni Heino**, Ph.D. thesis review, 2005, **Simo Särkkä**, Ph.D. thesis review, 2006, **Jimmy Kjaersgaard-Rasmussen** (Denmark), Ph.D. thesis review and opponent, 2010, **Roland Eichardt** (Germany), Ph.D. thesis review, 2010, **Hsin-Yu (Kent) Wei** (UK), Ph.D. thesis review and opponent, 2012, **Maomao Zhang**, (UK), Ph.D. thesis review and opponent, 2016, **Yunjie Yang**, (UK), Ph.D. thesis review and opponent, 2017, **Markku Åkerblom** (Finland), opponent, 2018, **Narong Borijindargoon** (Singapore), Ph.D. thesis review, 2019, **Shereen Abouelazayem** (Czech Republic), Ph.D. thesis review and opponent, 2022, **Zhou Chen** (UK), PhD thesis review and opponent, 2023 **Emmihenna Jääskeläinen** (Finnish Meteorological Institute), Licentiate thesis review, 2023, **Juha-Pekka Puska** (Finland), Ph.D. thesis review, 2023, **Thomas Suppan** (Austria), Ph.D. thesis review and opponent, 2024, **Jose Rodrigo Rojo Garcia,** Ph.D. Thesis opponent, 2025.
- Member of international peer evaluation committees of funding applications: Reviewer of funding applications of The Austrian Science Fund (FWF)
- Memberships and positions of trust in scientific and scholarly societies: Member of board of the Finnish Centre of Excellence in Inverse Problems Research 1.1.2012-31.12.2017: Associate editor of the journal "Inverse Problems in Science and Engineering", 16.12.2015-31.12.2021: Associate editor of the journal "IEEE Sensors Journal", 2018-
- Referee for scientific and scholarly journals: Referee of more than 120 papers in e.g. the following journals: IEEE Transactions on Biomedical Engineering, Inverse Problems in Science and Engineering, Measurement Science and Technology, IEEE Transactions on Magnetics, IEEE Transactions on Medical Imaging, Inverse Problems, Physiological Measurement, Journal of Petroleum Technology and Alternative Fuels, Physics in Medicine and Biology, Transactions on Image Processing, Journal of Medical Engineering, IEEE Sensors Journal
- Invited keynote lectures abroad: Total of ~40 invited talks in conferences, workshops and universities
- Organizing scientific conferences: As a member of scientific advisory board in several international scientific conferences. Reviewing abstracts and full papers for the conference proceedings