

RIMPILÄINEN, VILLE: CURRICULUM VITAE

Name: Ville Juho Tapani Rimpiläinen

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Work Experience

- **Visiting researcher (grant holder):** University of Münster (Germany), Institute for Biomagnetism and Biosignalanalysis, Methods in Bioelectromagnetism workgroup, 1.10.2014-31.8.2016: research on Bayesian inverse problems in electroencephalography (EEG) source imaging and regularization techniques in vector field tomography
- **Post-doc research fellow:** University of Auckland (New Zealand), Department of Mathematics, The Applied Mathematics Unit and the Industrial Information and Control Centre (I2C2), 24.7.2012-23.4.2014: process tomography, multivariate data-analysis of industrial data and statistical prediction of functional properties of dairy products based on manufacturing data
- **Researcher:** University of Eastern Finland (Finland), Department of Applied Physics, The Mathematical Modelling and Information Analysis Group and the Inverse Problems Group, 11.6.2007 – 31.5.2012: PhD studies, research on electrical tomography imaging of manufacturing processes in pharmaceutical industry, supervision of undergraduates during physics laboratory course
 - o University of Saskatchewan (Canada), Department of Chemical Engineering, research visitor in the FLASK research group, 9.5.2011 – 30.8.2011: electrical capacitance tomography imaging of fluidized-bed during drying of wet granules
- **Teacher of physics and mathematics:** Puumala upper secondary school (Finland), 1.8.2006 – 31.7.2007
- **Research assistant:** Tampere University of Technology (Finland), Optoelectronics Research Centre (ORC), 20.5.2002 – 31.8.2005: characterization of AlGaInP diode lasers and semiconductor materials, running of molecular beam epitaxy (MBE) growth unit

Education

- Doctor of Philosophy on Technical and Computational Physics, University of Eastern Finland, Department of Applied Physics, May 2012
- Master of Science in Technology, Tampere University of Technology, Department of Science and Engineering, August 2006
 - o Major: Technical Physics
 - o Minors: Technical Mathematics, Electronics and Pedagogics

Research Interests

- Medical imaging and process tomography:
 - o Electroencephalography (EEG)
 - o Electrical capacitance tomography (ECT)
 - o Electrical impedance tomography (EIT)
- Inverse problems, Bayesian inverse problems
- Finite element method (FEM)
- Multivariate data-analysis, statistical models

Language Skills

- Finnish (native), English (fluent), Swedish (fair), Germany (basics)

Peer-reviewed Publications

- A. Koulouri, M. Brookes, V. Rimpiläinen, 'Vector tomography for reconstructing electric fields with non-zero divergence in bounded domains', *Journal of Computational Physics*, Revised in August 2106
- A. Koulouri, V. Rimpiläinen, M. Brookes, J. P. Kaipio, 'Compensation of domain modelling errors in the inverse source problem of the Poisson equation: application in electroencephalography imaging', *Applied Numerical Mathematics*, 106, 24-36, 2016
- V. Rimpiläinen, J. P. Kaipio, N. Depree, B. R. Young, D. I. Wilson, 'Predicting functional properties of milk powder based on manufacturing data in an industrial-scale powder plant', *Journal of Food Engineering*, 153, 12-19, 2015
- M. Vauhkonen, V. Rimpiläinen, L. Heikkinen, 'Three-dimensional capacitance tomography of a fluidized bed reactor', *2012 IEEE International Instrumentation and Measurement Technology Conference (Graz, Austria)*, 2012
- V. Rimpiläinen, L. M. Heikkinen, M. Vauhkonen, 'Moisture distribution and hydrodynamics of wet granules during fluidized-bed drying characterized with volumetric electrical capacitance tomography', *Chemical Engineering Science*, 75, 220-234, 2012
- S.-P. Simonaho, R. Laitinen, V. Rimpiläinen, L. Heikkinen, M. Vauhkonen, J. Paaso, M. Juuti, J. Ketolainen, 'PROMIS Centre: innovative pharmaceutical manufacturing research and technology development in Kuopio, Finland', *Dosis*, 28, 251-261, 2012
- V. Rimpiläinen, S. Poutiainen, L. M. Heikkinen, T. Savolainen, M. Vauhkonen, J. Ketolainen, 'Electrical capacitance tomography as a monitoring tool for high-shear mixing and granulation', *Chemical Engineering Science*, 66, 4090-4100, 2011
- V. Rimpiläinen, S. Poutiainen, L. M. Heikkinen, T. Savolainen, M. Vauhkonen, J. Ketolainen, 'Monitoring of high-shear mixing and granulation with capacitive measurements and tomography', *6th world congress on industrial process tomography (Beijing, China)*, 44-51, 2010
- V. Rimpiläinen, M. Kuosmanen, J. Ketolainen, K. Järvinen, M. Vauhkonen, L. M. Heikkinen, 'Electrical impedance tomography for three-dimensional drug release monitoring', *European Journal of Pharmaceutical Sciences*, 41, 407-413, 2010
- V. Rimpiläinen, L. M. Heikkinen, M. Kuosmanen, A. Lehtikoinen, A. Voutilainen, M. Vauhkonen, J. Ketolainen, 'An electrical impedance tomography-based approach to monitor in vitro sodium chloride dissolution from pharmaceutical tablets', *Review of Scientific Instruments*, 80, 103706, 2009
- A. Laakso, M. Dumitrescu, L. Toikkanen, A. Tukiainen, V. Rimpiläinen, M. Pessa, 'Simulation of quantum wells with 'spikes' and 'dips'', *Optical and Quantum Electronics*, 40, 319-324, 2008
- A. Tukiainen, L. Toikkanen, M. Haavisto, V. Erojärvi, V. Rimpiläinen, J. Viheriälä, M. Pessa, 'AlInP-AlGaInP Quantum Well Lasers Grown by Molecular Beam Epitaxy', *IEEE Photonics Technology Letters*, Vol. 18, No. 21, November 1, 2006
- P. Laukkanen, J. Pakarinen, M. Ahola-Tuomi, M. Kuzmin, R. E. Perälä, I. J. Väyrynen, A. Tukiainen, V. Rimpiläinen, M. Pessa, M. Adell, J. Sadowski, 'Electronic and structural properties of the InP(100)(2x4) surface studied by core-level photoemission and scanning tunneling microscopy', *Surface Science*, 600, 3022-3027, 2006
- L. Toikkanen, A. Tukiainen, M. Dumitrescu, V. Rimpiläinen, S. Ikonen, V. Erojärvi, M. Pessa, 'Suppression of TE polarization by a multi-quantum-barrier structure in sub-630 nm tensile-strained GaInP/AlGaInP QW lasers', *IEEE Photonics Technology Letters*, Vol. 17, No. 12, December 2005

Book Chapter

- J. P. Kaipio, A. Seppänen, M. Vauhkonen, A. Lipponen, A. Voutilainen, A. Lehtikoinen, V. Rimpiläinen, 'Process Tomography and Estimation of Velocity Fields', in: M. Wang (Editor), *Industrial tomography: systems and applications*, Woodhead Publishing, 2015

Theses

- V. Rimpiläinen, Doctor of Philosophy Thesis, 'Electrical tomography imaging in pharmaceutical processes', University of Eastern Finland, 2012
- V. Rimpiläinen, Master of Science (tech.) Thesis, 'Kytkeytyjen kvanttikaivojen elektroluminesenssi AlGaInP-lasereissa (Electroluminescence of coupled quantum wells in AlGaInP lasers)', Tampere University of Technology, 2005

Selected Conference Abstracts, Talks & Posters

- V. Rimpiläinen, 'Bayesian Approximation Error Approach in Electroencephalography Imaging', *HD-Tomo Days, (Copenhagen, Denmark), 2016*
- A. Koulouri, V. Rimpiläinen, M. Brookes, J. P. Kaipio, 'Approximation errors in EEG source imaging', *Inverse Days (Tampere, Finland), 2014*
- V. Rimpiläinen, J. P. Kaipio, I. Boiarkina, T. Munir, W. Yu, B. Young, N. Depree, A. Prince-Pike, D. I. Wilson, '“Snakes on a Plane”: Using Time-dependent Multivariable Techniques to Predict Functional Properties of Milk Powder in the Control Room', *EuroPACT 2014: 3rd European Conference on Process Analytics and Control Technology (Barcelona, Spain), 2014*
- V. Rimpiläinen, J. P. Kaipio, T. Savolainen, P. Kaipio, L. M. Heikkinen, M. Vauhkonen, 'Electrical Capacitance Tomography Imaging of Wet Granules during Drying: Temperature Dependence of the Data and Scale-up of the Sensor', *EuroPACT 2014: 3rd European Conference on Process Analytics and Control Technology (Barcelona, Spain), 2014*
- V. Rimpiläinen, I. Boiarkina, N. Depree, W. Yu, D.I. Wilson, 'Who's to blame? Relating Input Disturbances to Output Variations in Milk Powder Fortification', *IFPAC: International Foundation Process Analytical Chemistry (Arlington, Washington DC, USA), 2014*
- N. Depree, I. Boiarkina, V. Rimpiläinen, A. Prince-Pike, B. Young, D. Wilson, 'Process Analytical Technology Application for Real Time Quality Monitoring during Milk Powder Production', *IFPAC: International Foundation Process Analytical Chemistry (Arlington, Washington DC, USA), 2014*
- V. Rimpiläinen, L. M. Heikkinen, T. Savolainen and M. Vauhkonen, S. Poutiainen and J. Ketolainen, 'Monitoring of high-shear mixing and granulation with electrical capacitance tomography', *EuroPACT 2011, 2nd European Conference on Process Analytics and Control Technology (Glasgow, UK), 2011*
- V. Rimpiläinen, 'Electrical Imaging Modalities in Pharmaceutical Applications: Drug Release Testing and High-Shear Mixing Granulation', *Inverse Days (Oulu, Finland), 2010*
- V. Rimpiläinen, M. Kuosmanen, S. Poutiainen, L. M. Heikkinen, T. Savolainen, M. Vauhkonen, K. Järvinen, J. Ketolainen, 'Electrical imaging modalities in pharmaceutical applications: Drug release testing and high-shear granulation', *Physics Days, (Jyväskylä, Finland), 2010*
- V. Rimpiläinen, L. Heikkinen, A. Lehtikoinen, A. Voutilainen, M. Kuosmanen, K. Järvinen, J. Ketolainen, 'Process Monitoring of Dissolution Test', *Helsinki Drug Research, (Helsinki, Finland), 2008*
- L. Heikkinen, V. Rimpiläinen, A. Lehtikoinen, M. Kuosmanen, J. Ketolainen, K. Järvinen, 'Tomography Imaging of Dissolution Test', *AAPS Annual Meeting and Exposition (San Diego, USA), 2007*

Grants

- Finnish Cultural Foundation, 2014
- Graduate School of Inverse Problems, 2011
- Finnish Cultural Foundation, 2010