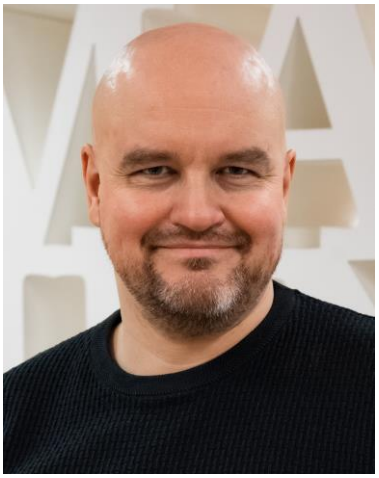
CURRICULUM VITAE



1. Personal details and the date of the CV

- Seppänen, Aku Olavi
- ORCID: https://orcid.org/0000-0002-4042-2254
- Date: September 6th, 2024

2. Degrees

- Ph.D, University of Kuopio (UKU), Physics, February 14th, 2006,
- M.Sc, University of Kuopio (UKU), Physics, May 11th, 2000
- Matriculation Examination, Kallavesi High School, Kuopio, Finland, June 4th, 1994
- Title of Docent: Applied Inverse Problems, University of Eastern Finland (UEF), October 1st, 2011.

4. Language skills

- Native language: Finnish
- Other languages: English (Excellent) and Swedish (Basic)

5. Current employment

- Professor, UEF, Dept. of Applied Physics, 1.1.2022 –

6. Most important previous employment relationships

Post	Workplace	Time
Associate Professor (tenure track)	UEF, Dept. of Applied Physics	1.1.2018-31.12.2021
Academy Research Fellow	UEF, Dept. of Applied Physics	1.9.2013 – 31.12.2017
Senior researcher/ University researcher	UEF, Department of Physics and Mathematics	1.1.2010 – 31.8.2013
Researcher	UKU, Department of Physics	5.6.2006 – 31.12.2009
Researcher	UKU, Department of Physics	1.7.1999 – 31.8.2005

8. Research funding and grants

External funding (as Principal investigator & project leader):

Project	Funded by	Amount
Research project *Bayesian inversion for distributed parameter estimation problems*, 2011-2013	Academy of Finland	304 k€
Academy Research Fellow project *Advanced modeling and inverse problems in non-destructive testing*, 2013-2018	Academy of Finland	425 k€
Research Fellow, additional funding, 2013-2016	Academy of Finland	210 k€
Academy of Finland, thematic call: Methods and applications for management and analysis of big data and open data, project *Four-dimensional Airborne Laser Scanning*, 2016-2017	Academy of Finland	177 k€
Research Fellow, additional funding, 2016-2018	Academy of Finland	140 k€
Horizon 2020: Science for Clean Energy, 2017-2020. Coordinator: UCL, UK. Total costs 9.8 M€ (my subproject: 498k€)	European Commission	498 k€
Centre of Excellence of Inverse Modelling and Imaging, 2018-2020	Academy of Finland	175 k€
Centre of Excellence of Inverse Modelling and Imaging, 2020-2022	Academy of Finland	95 k€
Horizon 2020, Science for Clean Energy, Additional funding 2020	European Commission	17 k€
Project *Markov Chain Analysis of Fugitive Gas emission*, 2021	UK Research and Innovation	17 k€
React-EU, investment and development project: *Tomography in the field*, 2021-2023.	Regional Council of Pohjois-Savo	310 k€
Centre of Excellence of Inverse Modelling and Imaging, 2023-2025	Academy of Finland	200 k€
EU Marie Curie: *Electro-conductive polymeric 3D scaffolds as novel strategies for biomedical applications*, 2023-2027	European Research Executive Agency	101 k€
The Innovation and Skills in Finland 2021–2017 programme: *Added value from data streams in bioeconomics research*, 2024-2026	Regional Council of Pohjois-Savo	51 k€
JTF, investment and development project: *Towards decentralised*	Regional Council of	415 k€

biogas production at Pohjois-Savo III, 2024-2025	Pohjois-Savo	
Validation of on-farm measurements of green-house gas emissions	MIRICO Ltd	25 k€
Total		**3.1 M€**

9. Research output

Publications: 73 peer-reviewed journal articles, **39** full papers in conference proceedings, **3** book chapters.

10 most cited publications according to Google Scholar:

Article	Citations
Karhunen et al: "Electrical resistance tomography…", *Cement and Concrete Research*, 40: 137-145, 2010.	**300**
Hallaji et al: "Electrical impedance tomography- …", Smart Materials and Structures 23: 085001, 2014	**205**
Seppänen et al: "State estimation with fluid dynamical…", *Inverse Problems* 17:467-483, 2001.	**147**
Hallaji et al : " Electrical resistance tomography…", *Cement and Concrete Research*, 69: 10-18, 2015.	**112**
Gehre et al: "Sparsity…", *Journal of Computational and Applied Mathematics*, 236: 2126–2136, 2012.	**111**
Karhunen et al: "Electrical Resistance Tomography for…", *ACI Materials Journal*, 107: 523-531, 2010.	**87**
G González et al: "Isotropic and…", *Computers & Mathematics with Applications* 74: 564-576, 2017	**84**
Smyl et al: "Can Electrical Resistance Tomography…", Cement and Concrete Research 91, 61-72, 2017.	**82**
Lähivaara et al: "Bayesian…" IEEE transactions on geoscience and remote sensing, 52: 2690-2699, 2013	**75**
Liu et al: "A nonlinear approach to difference imaging …", Inverse Problems 31 (3), 035012	**71**

Total number of citations: 3216, h-index: 34 (according to Google Scholar)

10. Research supervision and leadership experience

PI & Project leader in the projects listed above.

Supervision of post-doc researchers:

- Christina Brandt, PhD (graduated 2012), from September 2015 to February 2017
- Teemu Luostari, PhD (graduated 2013), from February 2016 to December 2017
- Anna Kaasinen, PhD (graduated 2013), from August 2017 to September 2020
- Antti Voss, PhD (graduated 2020), from February 2020 to December 2020, *and* since September 2024
- Matti Niskanen, PhD (graduated 2022), since April 2022

Supervision of under- and post-graduate students (See details below in Theses supervision)**:**

- Currently supervising: 6 PhD (all as principal supervisor) and 3 MSc students (all as principal supervisor)
- Completed theses: 9 PhD (6 as principal supervisor), 12 MSc (9 as principal supervisor), 8 BSc (5 as principal supervisor), 1 BEng (as co-supervisor)

Supervision of visiting scholars:

- Danny Smyl, MSc, Fulbright scholar from North Carolina State University, UEF, August 2016 – May 2017.
- Laura Dalton, MSc, Fulbright scholar from North Carolina State University, UEF, January – September 2021.

11. Teaching merits

Lecturing in UKU/UEF: 1) Transport phenomena (undergraduate course) 2002-2018, 2) Statistical inverse problems (postgraduate course) 2010-2024, 3) Electromagnetic field theory (undergraduate course) 2019-2023, 4) Mathematical methods in physics (undergraduate course) 2024.

Lecturing in other universities: 1) 24th international Jyväskylä Summer School, 10 h lectures + home work, August 2014, 2) 9th International Conference on Inverse Problems in Engineering (ICIPE), 10 h lectures, Waterloo, Canada, May 23-26, 2017.

I also prepared the lecture material for all the above courses.

Tutoring and supervision of students in UKU/UEF: Various physics laboratory courses and course in mathematics and physics since 1998.

12. Awards and honours

Pertti Lindfors award (10000 FIM) granted by Finnish Inverse Problems Society, 2000, for the work and achievements in computational methods for non-stationary inversion in process tomography. *This was the first time Pertti Lindfors award was granted.*
Best oral presentation award in Physics Days 2010, XLIV Annual Conference of the Finnish Physical Society, Jyväskylä, Finland, March 11 – 13, "Electrical resistance tomography imaging of concrete".

13. Other key academic merits

PhD thesis pre-examinations: 1) Martti Kalke, University of Helsinki, 2014, 2) Vladimir Shemyakin, Lappeenranta University of Technology, 2020, 3) Johannes Norberg, University of Helsinki, 2020, 4) Vilma Mannisenaho, University of Helsinki, 2024.
Opponent in PhD defense: 1) Esa Niemi, University of Helsinki, 2015, 2) Vladimir Shemyakin, Lappeenranta University of Technology, 2020, 3) Anu Kauppi, University of Helsinki, 2024.

External Committee member in PhD examination: 1) Milad Hallaji, North Carolina State University, NC, USA, 2015, 2) Reza Rashetnia, North Carolina State University, NC, USA, 2017, 3) Laura Dalton, North Carolina State University, NC, USA, 2022

Examiner of a PhD thesis: 1) Ekaterina Sherina, Technical University of Denmark, March 12, 2018, Nicolai André Brogaard Riis, Technical University of Denmark, April 29, 2021

Peer review: Acted as a peer reviewer in 22 international scientific journals since 2006.

Administration: Various administrative duties in UKU/UEF since 2006. Currently one of the PIs in the FAME Flagship (started in 2023), and the person in charge for Impact theme 6: Society

Invited lectures: Over 20 invited lectures national/international conferences/workshops and institutes since year 2000. In eleven (11) of them, the organizer has paid the travel expenses.

Organizing scientific meetings and courses: Participated in organizing 8 national/international conferences, workshops and minisymposiums since 2002.

14. Scientific and societal impact

Research dissemination:

Wide recognition of my research on 'sensing skin' for nondestructive testing of concrete; at least 80 reports, e.g., phys.org, NASA Tech Briefs, wn.com, Science Newsline, ScienceDaily, materialstoday, theEngineer and Capitalista.
Press release on multi-layer sensing skin for detection of cracks and chemicals in concrete in October 2016. At least 20 reports, e.g., American Laboratory, Business Standard, EurekAlert! and theEngineer.
Press release on tracking water in concrete, Nov. 2016. At least 12 reports, e.g., theEngineer, EurekAlert!, TechXplore,
Science Week, Tampere, Finland, October 2012: Public lecture 'Tomographic imaging' and demonstrations of electrical tomography for groups of high school students.
Science Break, Oulun normaalikoulu, Finland, September 30, 2019. Two lectures for high school students on Computational physics and inverse problems.
Breaking Lab – virtual tour at UEF tomography laboratory, Inverse Days, Online, December 14–18, 2020.

Open data: 1) A. Hauptmann, V. Kolehmainen, N. Minh Mach, T. Savolainen, A. Seppänen, S. Siltanen: "2D electrical impedance tomography dataset", 4 Apr 2017. 2) M. Räsänen, P. Kuusela, J. Jauhiainen, M. Arif, K. Scheel, T. Savolainen, A. Seppänen: Kuopio Tomography Challenge 2023 open electrical impedance tomographic dataset (KTC 2023), 2023

15. Other merits

International scientific visits: A total of 20 visits to foreign universities and research institutes, duration between 1 week and three months. Most important ones: 1) University of Dortmund, Jan 1 – Mar 31, 2002, 2) University of California in Berkeley, 2 months in 2007-2008, 3) University of Auckland, 2 months in 2009, 2019, 4) North Carolina State University, 3 months in 2012-2017.