# Curriculum Vitae: Sampsa Pursiainen

# **Personal information**



Family name: Pursiainen; Given name: Sampsa Tapio; ORCID: 0000-0002-9131-9070; Date of CV: June 16th, 2023; Education: PhD(Eng.);

Position: Associate Professor (Tenure Track); Affiliation: Mathematics, Tampere University; Address: PO Box 692, 33101 Tampere, Finland;

Email: sampsa.pursiainen@tuni.fi;

Web: https://www.linkedin.com/in/sampsa-pursiainen/;

Date of birth: 27/04/1978; Place of birth: Espoo, Finland;

Nationality: Finnish.

### **Degrees**

2009, PhD (Eng.), Institute of Mathematics, Helsinki University of Technology, Finland; 2003, Master of Science, Institute of Mathematics, Helsinki University of Technology, Finland; 2015 –, Docent (Adjunct Professor), Discipline: Applied Mathematics, Department of Mathematics and Systems Analysis, Aalto University, Finland.

# Language skills

Finnish (Mother tongue), English (Fluent), Swedish.

# **Current employment**

2022 – Professor (Applied Mathematics), Mathematics, Tampere University, Finland.

# Previous work experience

2019 – 2022, Associate Professor (Tenure Track), Mathematics, Tampere University, Finland.

2015 – 2018, Assistant Professor (Tenure Track), Department of Mathematics, Tampere University of Technology (TUT), Finland;

2012 – 2015, Postdoctoral Researcher, Academy of Finland, Department of Mathematics and Systems Analysis, Aalto University, Finland;

2012 – 2012, Postdoctoral Researcher, Department of Mathematics, Tampere University of Technology, Finland;

2011 – 2012, Postdoctoral Researcher, Department of Mathematics and Systems Analysis, Aalto University, Finland.

# **Research Funding and Grants**

2011 – 2022, Total Academy of Finland project funding EUR 1.787.518 (11 accepted projects);

2023–2024, PI in Academy of Finland researcher exchange project, Non-invasively reconstructing and inhibiting activity in focal epilepsy (DAAD/Academy of Finland, 354976).

2021 – 2023, PI in Academy of Finland (Era PerMed JTC2020) Project,

Personalised diagnosis and treatment for refractory focal paediatric and adult epilepsy, PerEpi (Academy of Finland, 344712);

2021 – 2023, PI in Academy of Finland ICT2023 Project, FETD-Based Tomographic Full-

Wave Radar Imaging of Small Solar System Body Interiors (Academy of Finland, 336151);

2021 – 2026, PI in Tampere University Imaging Platform, Part of PROFI6 Profiling Funding by Academy of Finland;

2020 – 2022, PI in Academy of Finland researcher exchange project, Reconstructing Somatosensory Network Connectivity with Advanced Bayesian Imaging and Finite Element Computations (DAAD, Academy of

Finland, 334465);

2018 – 2025, PI, Team Leader, Academy of Finland Centre of Excellence in Modelling and Imaging (312341, 336792, 326590);

2018–2020, PI in Academy of Finland researcher exchange project, Advancing Finite Element Computations for Reconstructing and Manipulating the Human Somatosensory Cortex (DAAD/Academy of Finland, 317165).

2016 – 2018, Academy of Finland Key Project (Academy of Finland, 305055), Department of Mathematics, Tampere University of Technology;

2012 – 2015, Postdoctoral Researcher, Combining finite element and Bayesian techniques in EEG and MEG imaging of the brain (Academy of Finland, 257288).

2018 – 2024, Funding admitted to supervised researchers exceeds a total of EUR 200.000 admitted by different Finnish Foundations and Research Funds as well as EUR 283.880 admitted by Academy of Finland.

# Research output

50 peer-reviewed publications, >788 citations, h-index 16. Fields of Research: Applied Mathematics. Biomedical Engineering, Medical Imaging, Neuroscience, Inverse Problems, Imaging Sciences, Planetary Science, Astrophysics. In addition to scientific publications, most significant methods published available as open source code projects in github.com and/or as open source data repositories under different service providers, including zenodo.org. Ten most important publications are enclosed in this application.

### **Supervision**

Currently the primary supervisor of 4 Doctoral Researchers and 2 Postdoctoral Researchers. Supervisor of 4 completed PhD Dissertations.

2022 –, Dr. Maryam Samavaki, PhD, Postdoctoral Researcher, Tampere University;

2018 -, Dr. Alexandra Koulouri, PhD, Postdoctoral Researcher, Tampere University;

2022 –, Mr. Santtu Söderholm, MSc, Doctoral Student, Tampere University, Finland (Appliation Submitted to Faculty of Information Technology and Communication Sciences);

2021 –, Mr. Yusuf Oluwatoki Yusuf, MSc, Doctoral Student, Tampere University, Finland;

2021 –, Mr. Fernando Galaz Prieto, MSc, Doctoral Student, Tampere University, Finland;

2021, Master's Thesis of Mr. Fernando Galaz Prieto, MSc, ENS Faculty, Tampere University, Finland.

2020 - Mr. Joonas Lahtinen, MSc, Doctoral Student, Tampere University, Finland.

2020 Master's Thesis of Mr. Lari Kuuppo, MSc, ENS Faculty, Tampere University, Finland;

2019 Master's Thesis of Ms. Qin He, MSc, ITC Faculty, Tampere University, Finland;

2018 – 2021, Dr. Liisa-Ida Sorsa, PhD(Eng.), Doctoral Student, Tampere University, Finland;

2017 Master's Thesis of Ms. Liisa-Ida Sorsa, MSc, Laboratory of Mathematics, Tampere University of Technology, Finland.

2017 – 2019, Dr. Defne Us, MSc, Doctoral Student (joint supervision w. Prof. Ulla Ruotsalainen, TUT).

2017 – 2022, Dr. Atena Rezaei, PhD(Eng.), Doctoral Student, Tampere University of Technology, Finland

2017, Master's Thesis of Ms. Tuuli Miinalainen, MSc, Laboratory of Mathematics, Tampere University of Technology, Finland.

2016 – 2020, Mr. Mika Takala, MSc, Doctoral Student, Tampere University, Finland.

#### The following grants have been admitted:

2022 – 2024/2025 Yusuf Oluwatoki Yusuf, three-year Doctoral researcher grant, Väisälä Foundation, Finland.

2024, Joonas Lahtinen, one-year Doctoral researcher grant, Jenny and Antti Wihuri Foundation, Finland.

2023, Joonas Lahtinen, one-year Doctoral researcher grant, Väisälä Foundation, Finland.

2022, Joonas Lahtinen, one-year Doctoral researcher grant, Väisälä Foundation, Finland.

2021, Atena Rezaei, one-year Doctoral researcher grant, Alfred Kordelin Foundation, Finland.

2020 – 2021, Liisa-Ida Sorsa, one-year Doctoral researcher grant, Emil Aaltonen Foundation, Finland.

2020, Atena Rezaei, one-year Doctoral researcher grant, Väisälä Foundation, Finland.

2018 – 2021, Academy of Finland Postdoctoral Researcher Dr. Alexandra Koulouri, Super-resolution driven by sparsity priors in linear inverse problems with application in microscopy and neuroimaging (Academy of Finland, 316542, 326454).

# **Teaching Activities**

- 2023, Lecturer, MATH.APP.730 Inverse Problems, Tampere University, Finland.
- 2022, Lecturer, MATH.APP.460 Numerical Analysis, Tampere University, Finland.
- 2021, Lecturer, MATH.APP.730 Inverse Problems, Tampere University, Finland.
- 2020, Lecturer, MATH.MA.160 Differential and Integral Calculus, Tampere University, Finland.
- 2020, Lecturer, MAT-01366 Mathematics 3, Tampere University, Finland.
- 2019, Responsible Teacher, MAT-68007 Topics in Mathematics: Math & Modeling Seminar, Tampere University, Finland.
- 2019, Lecturer, MAT-62006 Inverse Problems, Tampere University, Finland.
- 2018, Lecturer, Mat-62006 Inverse Problems, Tampere Summer School, Tampere University of Technology and University of Tampere, Finland.
- 2018, Responsible Teacher, MAT-67756 Post-Graduate Seminar in Mathematics, Tampere University of Technology, Finland.
- 2017, Lecturer, MAT-62006 Inverse Problems, Tampere University of Technology, Finland.
- 2016–2018, Lecturer, LTT-12201 Natural Sciences, Mathematics and Technology, Tampere University of Technology, Finland.

To develop my skills in teaching I have obtained pedagogical training obtained on the courses offered by Tampere University for its own teaching personnel.

# Other key academic merits

- 2020, Doctoral dissertation board member for Dr. Oriane Gassot's dissertation SAR imaging of an asteroid's regolith: simulation and data processing, Supervisor: Prof. Alain Hérique, Grenoble Alpes University, Grenoble, France
- 2021, Expert evaluator for Title of Docent, Candidate: Dr. Martin Simon, LUT University, Finland.
- 2020, Evaluator of research grant applications for Finnish Cultural Foundation's Pirkanmaa Regional Fund, Finland.
- 2022 2023, Member of Neurocenter Finland's steering group and activity group
- 2022 2025, Panel 1 (Mathematics) member (2022-2025) in Publication Forum JUFO
- 2022–, ESA's HERA mission workgroups with the focus on radar modelling
- 2019 –, Expert member in the Faculty Board of the Faculty of Engineering and Natural Sciences.
- 2021, Visiting Professor, I served as a at Institut Fresnel, Aix-Marseille University, Marseille, France, May-June 2021.
- 2021, Organizer of Inverse Days 2021, an international conference and the annual meeting of the Finnish Inverse Problems Society, together with my colleague Assoc. Prof. Pasi Raumonen and the students of the Inverse Problems research team of Tampere University. The conference had 139 participants many of whom came from abroad.
- 2022, Scientific Organizing Committee member for the Finnish Mathematical Days 2022, the annual international meeting of the Finnish Mathematical Society, Tampere, Finland.
- 2003 –, Member, Finnish Inverse Problems Society (FIPS), Finland.
- 2015 –, Member, Finnish Mathematical Society, Finland.
- 2023 –, Member of Sigma Xi, The Scientific Research Honor Society, USA.

#### Scientific and societal impact

The impact of my research concerns both mathematical methods and their applications. I promote open science by publishing many of my research results in journals supporting the principles of open access publishing. I publish an openly available preprint version always when it is allowed by the journal's preprint policy. In addition, I try to publish the most significant computing codes and scripts on open platforms such as github.com (https://github.com/sampsapursiainen) and zenodo.org. An example of such a case is Zeffiro Interface (ZI), a tool for modelling and inverting electromagnetic fields in brain, which has been published both as an article as a code package in github. All the releases have been also published as separate packages in zenodo.org which associates them with a digital object identifier (DOI). ZI package in its current form includes open codes and algorithms of several publication projects. The societal impact of my research comes from the importance of the space science and exploration and health care for the society, and the key role of Inverse Problem Mathematics in these fields.