July 30, 2025

Curriculum Vitae for Per Christian Hansen

Professor Per Christian Hansen has worked with numerical regularization algorithms for many years, he has published 5 books and 100+ papers in leading journals. He has developed several MATLAB software packages, such as Regularization Tools (now in its 4th version) and AIR Tools II for inverse problems and computed tomography. His h-index is 56 according to Google Scholar (July 2024) and he is a SIAM Fellow.

His research lies within applied mathematics, where theoretical analysis (e.g., perturbation theory and convergence analysis) goes hand in hand with practical development and implementation of robust, adaptive and efficient computational methods. His work has applications in, e.g., computed tomography for materials science, image deblurring, signal analysis, antenna design and sound source reconstruction.

He holds a VILLUM Investigator grant that funds the research initiative CUQI for Computational Uncertainty Quantification for Inverse Problems. The goal is to create a computational platform, suited for non-experts, to characterize and study how errors and uncertainties in the data and the mathematical models for inverse problems propagate to the computed solution. The first version of the software CUQIpy was released in the fall of 2022.

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Full name: Per Christian Hansen.

Title: Professor in Scientific Computing, Villum Investigator.

Born: July 9, 1957 in Nyborg, Denmark. **Citizenship:** Danish.

Family: Children: Martin S. Neukirch (born 1991) and Sara B. Neukirch (born 1994).

Address: Buddinge Hovedgade 149, 1.th., DK-2860 Søborg, Denmark. Phone: +45 23.65.27.98.

Work: DTU Compute (Department of Applied Mathematics and Computer Science), Section for Scientific Computing, Technical University of Denmark, DK-2800 Lyngby. Phone: +45 45.25.33.51. Direct: +45 45.25.30.97. Email: `pcha@dtu.dk`. URL: `people.compute.dtu.dk/pcha`.

Specialization: Numerical analysis. Computational methods for inverse problems. Regularization methods. Computational uncertainty quantification. Iterative regularization. Matrix computations. Matlab packages.

Education

- 1977–1982: MSc student at the Technical University of Denmark (DTU).
- 1982–1984: PhD student at the Department of Numerical Analysis, DTU.

Degrees

- 1982: MSc in Electrical Engineering, DTU.
- 1985: PhD in Numerical Analysis, DTU.
- 1996: DrTechn in Numerical Analysis, DTU.

Employments

- 1985: Research Fellow, Department of Numerical Analysis, DTU.
- 1985–1988: Research Associate, Astronomical Observatory, Univ. Copenhagen.
- 1988–1996: Senior Consultant, UNI•C.
- Since 1996: Professor, Department of Applied Mathematics and Computer Science, DTU.

Research Visits Abroad

- 1986: Research Associate (6 months), Department of Computer Science, Stanford University, supported by a Fulbright Grant.
- 1988: Research Associate (1 month), Department of Mathematics, Oak Ridge National Laboratory, during the Numerical Linear Algebra Year.
- 1989: Research Associate (7 months), Dept. of Mathematics, UCLA.
- 1990: Visiting Scholar (1 month), Math. and Comp. Science Div., Argonne National Lab.
- 1992: Visiting Scholar (1 month), University of California, Berkeley.
- 2004: Visiting Scholar (1 month), Department of Mathematics and Computer Science, Emory University, Atlanta.
- 2006: Visiting Scholar (1 month), Dept. Mathematics, Tufts University, Medford.
- 2020: Visiting Scholar (2 weeks), National Institute of Informatics, Tokyo, Japan, supported by JSPS.

Current Research Funding

- CUQI: Computational Uncertainty Quantification for Inverse problems, funded by a research grant from Villum Fonden (the Villum Foundation). Expires August 2026.

Awards

- 1990: BIT Prize for distinguished paper on numerical analysis in the journal BIT.
- 1994: Statoil Prize in recognition of the work in numerical analysis.
- 2005: ISI Web of Knowledge award as most cited Danish mathematician.
- 2015: SIAM Fellow in recognition of contributions to algorithms for rank-deficient and discrete ill-posed problems and regularization techniques.

Publications

- 5 books (2 as sole author).
- 1 edited book.
- 3 invited chapters.
- 127 papers in refereed journals.
- 58 conference papers etc.
- doctoral dissertation (defended at DTU 1996).
- 6 software packages.

Management Experience

- Head of Scientific Computing Section 2001–2013.
- Principal Investigator of several FTP research projects since 2007.
- Principal Investigator of an ERC Advanced Grant project since 2012.

Editorial Service

- SIAM Journal on Scientific Computing 2014–2022

Professional Memberships

- SIAM, Society for Industrial and Applied Mathematics (USA).
- Danish Academy of Technical Sciences.
- Danish Academy of Natural Sciences.

Post Doc Supervision

- Hans Henrik B. Sørensen (2009–12).
- Fabrice Delbary (2010–12).
- Martin S. Andersen (2012–14).
- Jakob Sauer Jørgensen (2012–14).
- Lauri Harhanen (2015–16).
- Jürgen Frikel (2015–16).
- Hans Martin Kjer (2016–17).
- Felipe Uribe (2020–2022).

- Babak Maboudi Afkham (2020–2024).
- Amal M. A. Alghamdi (2021–2025).
- Richard Huber (2024–2025).

Ph.D. Students

- Susanne M. Balle (scientific computing; finished 1995).
- Søren Holdt Jensen (signal processing; finished 1995).
- Peter Søren Kirk Hansen (signal processing; finished 1998).
- Ole Møller Nielsen (scientific computing; finished 1998).
- Rasmus Munk Larsen (scientific computing; finished 1998).
- Tim Hultberg (scientific computing; finished 2000).
- Andreas Percy Schumacher (inverse acoustic problems; finished 2000).
- Preben Kidmose (signal processing; finished 2001).
- Ann-Charlotte Berglund (inversion algorithms; finished 2002).
- Thorkild F. Pedersen (signal processing; finished 2003).
- Michael Jacobsen (inversion algorithms; finished 2004).
- Jan M. Rasmussen (boundary control, with Dept. of Mathematics; finished 2004).
- Esben Høgh-Rasmussen (large-scale tomography; finished 2006).
- Toke Koldborg Jensen (iterative inversion algorithms; finished 2006).
- Peter Søndergaard (wavelet analysis, with Dept. of Mathematics; finished 2007).
- Hans Henrik B. Sørensen (computational nano-science; finished 2008).
- Jesper Rasmussen (boundary control, with Dept. of Mathematics; finished 2009).
- Jakob Heide Jørgensen (tomography; finished 2013).
- Anders Skajaa (convex optimization; finished 2013).
- Oscar Borries (large-scale electromagnetics; finished 2015).
- Sara Soltani (tomography; finished 2015).
- Mikhail Romanov (tomography; finished 2016).
- Hari Om Aggrawal (tomography; finished 2018).
- Nicolai Riis (inverse problems, finished 2021).
- Katrine Ottesen Bangsgaard (uncertainty quantification, finished 2023).
- Kristoffer Linder-Steinlein (uncertain quantification, finished 2024).
- Silja Lønborg Christensen (uncertainty quantification, finished 2024).
- Laara Baalbai (uncertainty quantification).

Previous Funding

- CAP: Center for Applications of Parallel computers (SNF grant).
- CSI: Computational Science in Imaging (FTP grant).
- Desktop Scientific Computing on Consumer Graphics Cards (PI – FTP grant).
- DIIG: Danish Interdisciplinary Inversion Group (SNF grant).
- DINA: Danish Informatics Network in the Agricultural Sciences.
- Electrical Impedance Tomography (VKR Post Doc).
- EPOS: Efficient Parallel algorithms in Optimization and Simulation (PI – SNF grant).
- HD-Tomo: High-Definition Tomography (ERC advanced grant).
- Improved Impedance Tomography via Hybrid Data (Danish Research Council grant).
- MECOBS: Model., Est. and Control of Biotechnological Systems (NABIIT grant).
- nanoPar: Parallel Algorithms for Computational Nano-Science (FTP grant).
- Nano-Scale Design Tools for the Semiconductor Industry (Danish Research Council grant).
- NATO Collaborative Research Grants (twice) in signal processing algorithms.
- Partial Differential Equations and Applied Functional Analysis (SNF grant).
- SASI: Stabilization Algorithms for Large-Scale Inversion (PI – SNF grant).
- SCOSI: Scientific Comp. in Optimization, Simulation, and Inversion (SNF grant).
- WAVES: Wavelets in Audio/Visual Electronic Systems (STVF grant).