

Jacob Seifert

Curriculum Vitae

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Nationality: German

Summary

Researcher with expertise in computational imaging, machine learning, optics and data science. Hungry to learn, collaborate, and excited about understanding and visualizing data. Seeking to leverage my skills and experience to contribute to cutting-edge research, development and engineering.

Work

- 11/2024 – Present **Postdoctoral Researcher**, *Utrecht University, Nanophotonics Group*
Developing theoretical and experimental methods for optimizing estimation precision in semiconductor metrology. My work focuses on using estimation theory and optical control to identify maximum information states in complex scattering systems in collaboration with ASML Research.
- 01/2024 – 09/2024 **Postdoctoral Researcher**, *Advanced Research Center for Nanolithography (AR-CNL), Amsterdam*
Designed and implemented novel imaging algorithms to solve inverse problems in computational imaging, focusing on statistical methods and the modeling of event-based cameras.

Education

- 12/2018 – 12/2023 **Ph.D.**, *Nanophotonics Group, University Utrecht*
Thesis title: Differentiable Modeling for Computational Imaging (Defended on July 8th, 2024)
- 09/2017 – 08/2018 **Erasmus Research Internship**, *Molecular Biophysics Group, University Utrecht*
- 10/2015 – 08/2018 **M.Sc. in physics**, *Dresden University of Technology*
Master's thesis: Signal Optimization and Bleaching Reduction in Stimulated Emission Depletion Microscopy
- 10/2011 – 09/2015 **B.Sc. in physics**, *Dresden University of Technology*
Bachelor's thesis: Establishment of a lifetime measuring setup for short-lived, blue OLEDs

Publication Highlights

- 2025 Sanchez, F.A.R., **Seifert, J.**, Karpavicius, A., Gouder, M. & Witte, S. "Event-based reconstructions in Computational Microscopy" *EPJ Web Conf.* **335**, 01006 (2025)
- 2024 Pelekanidis, A., Zhang, F., Gouder, M., **Seifert, J.**, Du, M., Eikema, K.S.E. & Witte, S. "Illumination diversity in multiwavelength extreme ultraviolet ptychography" *Photonics Res.* **13**, 2757-2771 (2024)

- 2024 Coene, W., Shao, Y., Weerdenburg, S., Senhorst, S., Horsten, R., Urbach, H.P., **Seifert, J.** & Mosk, A.P. "EUV imaging of nanostructures without lenses" *Proc. SPIE* **13115**, 22-25 (2024)
- 2024 Shao, Y., Weerdenburg, S., **Seifert, J.**, Urbach, H.P., Mosk, A.P. & Coene, W. "Wavelength-multiplexed multi-mode EUV reflection ptychography based on automatic differentiation" *Light Sci. Appl.* **13**, 196 (2024)
- 2024 **Seifert, J.**, Shao, Y. & Mosk, A. P. "Noise-robust latent vector reconstruction in ptychography using deep generative models" *Opt. Express* **32**, 1020-1033 (2024)
- 2023 **Seifert, J.**, Shao, Y., van Dam, R., Bouchet, D., van Leeuwen, T. & Mosk, A. "Maximum-likelihood estimation in ptychography in the presence of Poisson-Gaussian noise statistics" *Opt. Lett.* **48**, 6027-6030 (2023)
- 2022 Maathuis, K., **Seifert, J.** & Mosk, A. P. "Sensor fusion in ptychography" *Opt. Continuum* **1**, 1909 (2022)
- 2021 **Seifert, J.**, Bouchet, D., Loetgering, L. & Mosk, A. P. "Efficient and flexible approach to ptychography using an optimization framework based on automatic differentiation" *OSA Continuum, OSAC* **4**, 121-128 (2021)
- 2021 Bouchet, D., **Seifert, J.** & Mosk, A. P. "Optimizing illumination for precise multi-parameter estimations in coherent diffractive imaging" *Opt. Lett., OL* **46**, 254-257 (2021)

Teaching

- 2024 **Computational Imaging**, *Utrecht University*, Lecture in physics master course
- 2018 – 2023 **Supervision of student projects**, *Nanophotonics group at Utrecht University*, daily supervision of a total of three M.Sc. and three B.Sc. graduates
- 2021 – 2023 **Rapid Prototyping: Lili's Proto Lab**, *Utrecht University*, Working as a coordinator of an emerging multi-disciplinary digital fabrication lab. This work involved planning, outreach, and building a community of makers comprised of students and employees
- 2019 – 2021 **Photon Physics**, *M.Sc. course at Utrecht University*, Teaching assistant for a course entailing a wide range of topics from modern photonics and optics with an emphasis on theory and computational methods
- 2021 **Experimental Design**, *M.Sc. course at Utrecht University*, Teaching assistant on the principles of planning, designing, documenting, and collaboratively executing physics experiments

Utrecht, 19th October, 2025