

Education

- 2019-2025
Sep. (est) **PhD in Computer Science**, KTH Royal Institute of Technology, Sweden.
Thesis: **Neuromorphic computing in space and time**.
Advisors: [Jörg Conradt](#) (KTH) and [Arvind Kumar](#) (KTH, Karolinska Institute).
Research stay: Stanford University, supervised by [Sadasivan Shankar](#).
- 2016-2019 **MSc in IT & Cognition**, University of Copenhagen.
Thesis: Modelling learning systems in spiking and artificial neural networks.
- 2011-2015 **BSc in Computer Science**, IT-University of Copenhagen.
Thesis: Predictable firm real-time Java. In collaboration with CERN.
- 2009-2011 **BSc in Political Science**, University of Aarhus, Denmark.
Thesis: Proxy voting in the European Union.

Honours, Grants & awards

- 2025 [Wallenberg-Bienenstock Postdoctoral Fellowship Program](#) at Stanford University, USA.
- 2025 [Mahowald Early Career Award](#) for work on the Neuromorphic Intermediate Representation.
- 2024 [NSF AccelNet NeuroPAC Fellowship](#) at Stanford University, USA.
- 2022 - 2025 Several compute grants for Swedish National Infrastructure.

Peer-reviewed publications (* indicates equal authorship)

- 2025 G. D'Angelo*, **J. E. Pedersen***, T. Hassan, M. Cianchetti, J. Bongard, F. Iida, G. Indiveri, M. Hoffmann, C. Laschi, C. D. Luca, C. Bartolozzi, E. Donati. "A Benchmarking Framework for Embodied Neuromorphic Agents". *In review*.
- 2025 **J. E. Pedersen**, J. Conradt, & T. Lindeberg. "Covariant spatio-temporal receptive fields for spiking neural networks". [Nature Communications](#) [IF: 17.69].
- 2025 J. P. Romero B., D. Korakovounis, **J. E. Pedersen**, J. Conradt. "Low-latency neuromorphic air hockey player". [Neuromorphic Computing and Engineering](#) [IF: 6.1].
- 2024 **J. E. Pedersen***, S. Abreau*, J. Eshraghian, et al. "The Neuromorphic Intermediate Representation". [Nature Communications](#) [IF: 17.69].
- 2024 S. Abreau*, **J. E. Pedersen***, K. Heckel*, & A. Pierro. "Q-S5: Towards Quantized State Space Models." [ICML - Next Generation of Sequence Modeling Architectures](#) [Acceptance rate: 30.5%].
- 2024 S. Abreau, **J. E. Pedersen**. "Neuromorphic Programming: Emerging Directions for Brain-Inspired Hardware". [International Conference on Neuromorphic Computing Systems](#).
- 2024 A. Geminiani, J. Kathrein, ..., **J. E. Pedersen** et al. "Multidisciplinary and collaborative training in neuroscience: Insights from the Human Brain Project Education Programme". [Neuroinformatics](#) [IF: 2.7].
- 2023 **J. E. Pedersen**, R. Singhal, & J. Conradt. "Translation and Scale Invariance for Event-Based Object tracking". [Neuro Inspired Computational Elements Conference \(NICE\)](#).
- 2023 **J. E. Pedersen** & J. Conradt. "AESTream: Accelerated event-based processing with coroutines." [Neuro Inspired Computational Elements Conference \(NICE\)](#).
- 2023 J. P. Romero B., L. A. Plana, A. Rowley, M. Hessel, **J. E. Pedersen**, S. Furber, J. Conradt. "A High-Throughput Low-Latency Interface Board for SpiNNaker-in-the-loop Real-Time Systems." [ICONS - International Conference on Neuromorphic Systems](#).
- 2018 J. Mogensen, N. Duggaard, S. Kitsios, **J. E. Pedersen**, M. Overgaard. "Understanding the neurocognitive organization as strategies rather than functions: Implications for neurological research." *EC Neurology*.

Open-access publications (* indicates equal authorship)

- 2025 P. Taborsky, I. Colonnelli, K. Kurowski, R. Sarma, N. H. Pontoppidan, B. Jansík, N. S. Detlefsen, **J. E. Pedersen**, R. Larsen, L. K. Hansen. “Towards a European HPC/AI ecosystem: a community-driven report.” [Proceedings of the Second EuroHPC user day](#). J. Turner, **J. E. Pedersen**, J. Conradt, & T Nowotny, “Event-based dataset for classification and pose estimation.” [Neuro Inspired Computational Elements Conference \(NICE\)](#).
- 2022
- 2020 **J. E. Pedersen***, C. Pehle*, “Norse - Spiking neural network for deep learning.” [Zenodo](#).

Professional Experience

- 2018-2025 **External lecturer**, IT-University of Copenhagen, Denmark. I planned and taught courses on Python and data science to 200+ students with outstanding reviews ($\geq 5.2/6.0$).
- 2016-2019 **Adjunct professor**, Copenhagen Business Academy, Denmark. I lectured on machine learning, artificial intelligence, business analytics and distributed systems infrastructure to 150+ students with outstanding reviews.
- 2016-2019 **Chief Technology Officer**, Mobilized Construction, Denmark, Kenya. I designed a globally distributed software stack, managed 15+ team members in US, Wales, Kazakhstan, and Kenya.
- 2014-2016 **Software engineer**, CERN, Switzerland. I developed and maintained critical monitoring tool-chain and testbed infrastructure for the Large Hadron Collider.

Selected talks

- 2025 Open-Source Neuromorphic Research Infrastructure — [Open Neuromorphic Workshop](#).
- 2025 Reproducibility and interoperability in neuromorphic computing — [Nengo Summer School](#).
- 2024 NIR: A unified instruction set for brain-inspired computing — [Telluride Neuromorphic Cognition Engineering Workshop](#) and [Spiking Neural networks as Universal Function Approximators](#)
- 2023 Translation and Scale Invariance for Event-Based Object tracking — [Neuro Inspired Computational Elements Conference \(NICE\)](#).
- 2023 The need for neuromorphic abstractions — [Open Neuromorphic workshop](#).
- 2021 Norse: A library for gradient-based learning in Spiking Neural Networks — Workshop on [Spiking Neural networks as Universal Function Approximators \(SNUFA\)](#).

Supervision experience

I supervised 10+ students during my work as a PhD student at KTH, adjunct professor at Copenhagen Business Academy, and CTO for Mobilized Construction. They resulted in multiple community contributions and published work. Selected projects are listed below.

- 2024 Oskar Strömberg, *Event-based vision with spiking vision transformers*, KTH, MSc.
- 2022 Philipp Mondorff, *Spiking Reinforcement Learning for Robust Robot Control*, KTH, MSc.
- 2022 Merlin Sewina, *Decoding EEG with Spiking and Artificial Neural Networks*, KTH, MSc.
- 2020 Mikkel Ziemer, *Building CERN's Control System*, CPHBusiness, BSc.

Community Contributions

I am driving development of several widely-used neuromorphic computing libraries ([NIR](#), [Norse](#), [AESTream](#), [Faery](#)) with over 500,000 downloads. I review for several neuromorphic venues, including the [Journal of Neuromorphic Computing and Engineering](#), the [Neuro Inspired Computational Elements Conference \(NICE\)](#), and the [International Conference on Neuromorphic Systems \(ICONS\)](#). I have organized and led numerous events including at the [Telluride Neuromorphic Cognition Engineering Workshop](#) and [CapoCaccia Workshop](#) toward Neuromorphic Intelligence. Finally, I am chairing the [Open Neuromorphic Community](#).