

Education

- 2019-2025 **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-Bienstock 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 Compute grants for 50000+ hours via the [Swedish national supercomputing 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].
- 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*.
- 2024 **J. E. Pedersen***, S. Abreau*, J. Eshraghian, et al. "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. Dauggaard, 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 **J. E. Pedersen**, D. Korakovounis, J. Conradt, “GERD: Geometric event response data generation.” [arXiv](#).
- 2022 J. Turner, **J. E. Pedersen**, J. Conradt, & T Nowotny, “Event-based dataset for classification and pose estimation.” [Neuro Inspired Computational Elements Conference \(NICE\)](#).
- 2020 **J. E. Pedersen***, C. Pehle*, “Norse - Spiking neural network for deep learning.” [Zenodo](#).

Professional Experience

- 2025- **Postdoc**, DTU Electro, Denmark. Supervised by [Peter Gerstoft](#).
- 2025 **Consultant**, Innatera, The Netherlands. Consulting on neuromorphic algorithms and [NIR](#).
- 2018-2025 **External lecturer**, IT-University of Copenhagen, Denmark. I planned and taught courses on Python and data science to 500+ 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 \(NICE\)](#).
[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 Philpp 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.

Teaching experience

I designed and taught courses on programming languages (Java, Python, C++), distributed systems, and advanced machine learning during my employments at CPHBusiness, ITU, and KTH. Both colleagues and students have consistently evaluated my teaching favorably. I have given

several tutorials on state-of-the-art research ranging from [real-time neuromorphics with spiking neural networks](#) to a [hands-on demonstration for the Neuromorphic Intermediate Representation](#). Currently, I am periodically contributing with education material via the [Open Neuromorphic Hacking Hours](#).

Community Contributions

I drive the 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 chair the [Open Neuromorphic Community](#) with over 2000 members.