Gregor Lenz

Curriculum Vitae

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Education

2017 – 2021 **PhD in Neuromorphic Engineering**, *Sorbonne Université*, Paris, France
Worked on fully event-based computer vision algorithms with neuromorphic cameras and on mobile applications thereof. Face detection and tracking, eye tracking, visual speech detection. Spiking Neural Networks on Intel's Loihi chip.

2012 – 2014 **Master's Degree in Biomedical Engineering Sciences**, *UAS Technikum Wien*, Vienna, Austria
Medical Image Processing, EEG Acquisition and Analysis, Electromagnetic Compatibility. Grade: 1.49, equal to an A with high distinction.

2009 – 2012 **Bachelor's Degree in Biomedical Engineering**, *UAS Technikum Wien*, Vienna, Austria
Focus on Medical & Hospital Engineering: Bioelectrical Signals, Medical Sensors, Circuit Design, Signal Analysis, Embedded Systems.

Experience

2021 – now **Neuromorphic Machine Learning Engineer**, *SynSense*, Zurich, CH
Developing tools and algorithms for spike-based computer vision on neuromorphic hardware.

2017 **Computer Vision Researcher**, *Prophesee*, Paris, FR
Working on gesture recognition for commercial applications using event-based cameras.

2016 – 2017 **Research Assistant at BioMedIA**, *Imperial College London*, UK
Part of a group that supplies functional neurosciene with latest imaging data about the brain. In particular I worked for the Developing Human Connectome Project (dHCP) that analyses the development of the fetal brain.

2016 **Software Developer**, *BJSS*, London, UK
At this IT consultancy I helped develop products for the Healthcare industry and ensured both quality of the team's code and ability to deliver by setting up a Continuous Delivery pipeline.

2015 – 2016 **Software Developer**, *Neova Health*, London, UK
Developed resilient and scalable software using agile development methods and functional programming. Tech lead responsible for interfaces to client hopitals.

2013 – 2014 **Software Developer**, *UAS Technikum Wien*, Vienna, AT
Redesigned sensor and actuator electronics of a lung simulator 'iLung' in EU-projects AlveoPic and ElBik and developed a telemonitoring solution.

Skills

Programming	Python, C++, Java, Scala	Simulation	Cadence, SPICE
Neurom. chips	Loihi, SpiNNaker, DynapSE	Event cameras	DVS, ATIS, DAVIS, Celex5

Teaching Experience

2017 **Computer Graphics**, *Imperial College London*, tutor

2016 **Computing Laboratory**, *Imperial College London*, tutor

2014 **Sensor electronics**, *UAS Technikum Wien*, demonstrator

Awards and scholarships

2020 **CapoCaccia 2020 fellowship**, postponed to 2022

2019 **Best demo award**, 14th IEEE International Conference on Face and Gesture Recognition

2014 **Scholarship of academic excellence**, for outstanding performance

2014 **Best application award**, pattern recognition for sleep spindle detection

Software

Loris: Python library to handle files from neuromorphic cameras.

Frog: An Android framework for event-based vision.

Tonic: Event-based datasets and transformations based on PyTorch.

Quartz: ANN-to-SNN conversion using precise timing on Loihi.

Languages

German: mother tongue, **English**: C2 - proficient, **French**: B2 - advanced

Selected publications

2021 **Neural computation using precise timing on Loihi**, *In preparation*, **Lenz G**, Oubari O, Orchard G, Ieng SH and Benosman R

2021 **Adversarial Attacks on Spiking Convolutional Networks for Event-based Vision**, *arXiv preprint*, Büchel J, **Lenz G**, Hu Y, Sheik S and Sorbaro M

2021 **Training spiking neural networks using lessons from deep learning**, *arXiv preprint*, Eshraghian J, Ward M, Neftci E, Wang X, **Lenz G**, Dwivedi G, Bennamoun M, Jeong DS and Lu W

2021 **Computationally Efficient Learning on Very Large Event-based Datasets**, *Under review*, Exarchakis G, Oubari O, **Lenz G**, Benosman R and Ieng SH

2020 **A mixed-signal hardware accelerator for brain machine-interfaces**, *ISCAS*, Haessig G, Lesta DG, **Lenz G**, Benosman R and Dudek P

2020 **High Speed Event-based Face Detection and Tracking in the Blink of an Eye**, *Frontiers of Neuroscience*, **Lenz G**, Ieng SH and Benosman R

2019 **Event-based Visual Gesture Recognition with Background Suppression running on a smart-phone**, *14th IEEE International Conference on Automatic Face & Gesture Recognition*, Maro JM, **Lenz G**, Reeves C and Benosman R