

Igor Krawczuk

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Education

- Sep. 2017 – **Electrical Engineering Doctoral Program**, École polytechnique fédérale de Lausanne, Lausanne, Switzerland, Focus: Neuromorphic memristive circuits for machine learning and artificial intelligence.
- Sep. 2014 – **M.Sc. Electrical and Computer Engineering**, TU Munich, Munich, Germany, Feb. 2017 Focus: Artificial Intelligence & Neuromorphic Systems, Robotics.
Masters Thesis: **Modelling and Design of Hybrid CMOS-Memristive Neuromorphic Systems for STDP Implementations**, Grade of Thesis: 1.0, Final Grade: 1.5
- Aug. 2015 – **Erasmus Exchange**, École polytechnique fédérale de Lausanne, Nov. 2016 Lausanne, Switzerland.
- Sep. 2011– **B.Sc. Electrical and Computer Engineering**, TU Munich, Munich, Germany, Aug. 2014 Focus: Embedded Systems & Robotics.
Bachelors Thesis: **High Performance Low Latency Sensor Readout on a Tabletop Robot**, Grade of Thesis: 1.3, Final Grade: 2.7

Experience

Professional

- Apr. 2018 – **Exchange at Samsung Korea**.
Jun. 2018 As part of my PhD I had the chance to work on high dimensional multi-objective optimisations using Gaussian Processes in conjunction with evolutionary algorithms
- Sep. 2017 – **ML/AI Consultancy**.
Ongoing Whenever my PhD allows, I help companies to apply the latest research to generate business value. This includes modeling and algorithm selection, PoC validation and creating an ML pipeline. I am familiar with most state of the art ML and AI techniques
- Mar. 2017 – **Trainee at SCI-STI-MM@EPFL**.
Aug. 2017 Researching the possibilities of Machine Learning in Dataflow Programming
- Nov. 2016 – **Resident Consultant at Blik**.
Feb. 2017 Developing the first product iteration of their integrated intra-logistics Localization and tracking system
- Apr. 2014 – **Freelance Software Engineer**.
Feb. 2017 Designed and implemented a range of projects, from Embedded System Firmware(C) over custom crawler, ETL and classification stacks(Python) to automated lead tracking using NLP (Python) and more
- Nov. 2015– **Laboratory Assistant**, EPFL, Lausanne.
May. 2015 Characterized Metal-Oxide Memristors using Agilent ATP
- Sep. 2015– **Teaching Assistant**, EPFL, Lausanne.
Dec. 2015 Guided and supported students through VHDL implementations of Multi-Core CPUs

University Projects & Research

- February 2016 - today **Test and Characterization Automation.**
Developed an open source Python3 library in order to automate a testing and characterization procedure. Development is ongoing
- January 2016 **Neuromorphic Stereovision Benchmarks.**
Implemented a novel depth detection algorithm on different platforms (x86 using concurrent Rust, SpiNNaker using C/Python) and presented Poster with comparison on HBP Educational Conference
- Sep 2015–Jan 2016 **VHDL and FPGA IC Design.**
As part of a Project Lab, implemented an 8-bit ALU (Full Custom Digital Flow), a multiplier (Semi custom Digital Flow) and a Full Adder (Full custom Analog Design Flow) using amongst other tools Modelsim and Cadence
- Feb 2015 – July 2015 **Cognitive Robotics.**
As part of a Project Lab, we programmed a NAO robot to play "Hot or Cold" with us, using ROS, OpenCV and Prolog for semantic reasoning

Technical and Personal skills

- **Software Engineering:**
I have experience setting up Continuous Integration and Git infrastructure (*Gitlab, Docker*) and have coordinated teams using Agile collaboration styles before. I am familiar with most important Data Structures and Algorithms.
- **Programming Languages:**
 - *Experienced in:* C/C++ (8 years), Python(6 years), Rust(4 years), MatLab(3 years)
Actively practised. In each language I have written projects spanning thousands of lines of high quality code. I can reason over and explain the specifics of language internals
 - *Familiar with:* Julia, VHDL, Verilog(-A), R, Elm, Java,C#
After reacclimatising, I can write professional level code. I can explain the language to new users and am familiar with the tooling.
- **Electrical Engineering:**
 - **Machine Learning, AI & Data Science, Neuromorphic Engineering** My focus during my Master and PhD, experience as Freelance Engineer, Knowledge of State of the Art
 - **Robotics, Embedded Systems, Control Theory** Focus during Bachelor, Knowledge of current techniques.
 - **IC Design - Analog and Digital** Focus during Erasmus Exchange year, basic familiarity.
- **Industry Software Skills:**
 - *Proficient in:* vim, Most MS Office products, Various IDEs, Linux Server Administration, tensorflow/pytorch and other ML frameworks
 - *Familiar with:* Cadence, ModelSim, LTspice
- **General:** I actively try to integrate well into teams and value clear communication, good documentation, long term thinking and adaptivity to changing requirements.
- **Languages:** Fluent in German and English, Confident in French, Basic Knowledge in Polish and Norwegian