Nicolas Baumann

Electronics Engineer

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Zurich, Switzerland

+41 76 575 91 18

https://n.ethz.ch/~nibauman

nibauman@student.ehtz.ch

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Profile

My name is Nicolas Baumann, I was born and raised near Zurich Switzerland. Engineering has been a childhood passion of mine for as long as I can remember. It started as an attraction towards mechanical engineering, as I started to construct and develop my own model aircraft in my early teenage years. However, my interest started to shift, as I got my hands on to my first Arduino microcontroller (MCU), shortly after completing my gymnasial matura education.
This lead me to invest a lot of leisure time and passion to develop personal MCU based projects which lead to the decision to study electrical engineering at ETH Zurich. Where I specialized in ultra low power edge device computation with energy efficient machine learning capabilities, computer vision and robotics.

Languages

English
Mother tongue and native speaker and CAE certificate
German
Mother tongue and native speaker
French
Extensive school knowledge and language stay

Education

Present – Feb/2019 — **MSc Electrical Engineering and Information Technology** — ETH
At the present I am a master student at the electrical engineering institute (D-ITET) of the ETH Zurich. My main focus is on ultra low power edge computing devices with incorporation of computationally efficient neural networks. The second emphasis regards computer vision and autonomous mobile robots.

Feb/2019 – Sep/2015 — **BSc Electrical Engineering and Information Technology** — ETH
I completed my bachelors degree at the electrical engineering institute (D-ITET) of the ETH Zurich. As a guideline to my subjects direction, I focused on solid state physics and embedded systems implementation.

Spring-RS15 — **Rekrutenschule** — Swiss Army
Completion of mandatory army service ranking as soldier

Jul/2014 – Jul/2010 — **Gymnasial Matura** — KZO Wetzikon
Completing a gymnasial matura at the Kantonsschule Zürcher Oberland (KZO) with the focus on mathematics and physics (PAM)

Engineering Experience

Master Thesis
Autonomous in-flight payload recovery of a fixed wing UAV. The drone utilises state of the art computer vision techniques to identify the ground payload. Using the target location as an anchor point of its worldframe, the UAV then performs EKF localisation to generate its trajectory vectors.

Semester Thesis II
Training and implementation of Convolutional Neural Networks to perform prey detection of any general cat. The deeplearning system has been implemented on an off the shelf Raspberry Pi 4 which achieves an average detection frame rate of 1 FPS. The device is mounted next to multiple cat flaps and has been featured on the 10th July 2020 official Raspberry Pi blog edition.

Semester Thesis I
Ultra low power consumption implementation of a variometer, which was integrated into a smartwatch coupled with multi-energy harvesting sources to achieve self-sustainability of the system. This project resulted in a journal publication by IEEE Transactions on Instrumentation and Measurement.

Publications

2019 — **N.Baumann, M.Ganz, and M.Magno, "Piepser 2.0: A Self-Sustaining Smartwatch To Maximize The Paragliders Flytime." in 2020 IEEE Transactions on Instrumentation and Measurement [Online].**
https://ieeexplore.ieee.org/document/8930284

2019 — **T.Fischer, M.Ganz, N.Baumann, and M.Magno, "Piepser:A smartwrist-worn variometer to maximize the paragliders flytime." in 2019 IEEESensors Applications Symposium (SAS), March 2019, pp. 1–6. [Online].**
https://ieeexplore.ieee.org/document/8705994