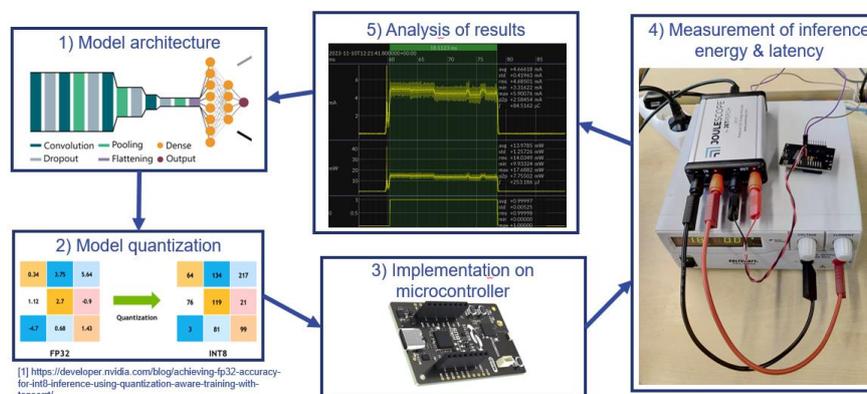


Master Thesis

TinyML for EEG Epileptic Seizure Detection

The Brain-MEP (Miniaturized Electrical Pulse Generator for Brain) project has the goal of developing a minimally invasive, implantable device for responsive neurostimulation used in epilepsy treatment. As a part of this project, the Laboratory for the Design of Microsystems is investigating the translation of EEG seizure detection algorithms to ultra-low-power hardware platforms. **Our research is conducted within the novel field of tiny machine learning (TinyML), where algorithms must perform adequately with very low power and latency.**

We have recently developed an automated energy measurement testbench and wish to use it to optimize EEG seizure detection algorithms with a variety of architectures across different commercially available hardware platforms.



Your Tasks

- **Implement EEG seizure detection algorithms** on a new hardware platform;
- **Adapt the energy measurement testbench** to work with this new hardware;
- **Identify opportunities to lower the energy consumption** on the target hardware;
- **Apply optimization techniques** such as neural architecture search.

Your Profile

- Currently a master's student in ESE, MSE, MST, or similar;
- Motivated about the intersection between low-power hardware and machine learning;
- Structured and independent way of working;
- Basic programming knowledge (Python and/or C).

This position is available for one motivated student who would start as a HiWi and then write their Master's thesis on the topic. Interested students are welcome to contact me with an up-to-date CV and Transcript of Records at jonathan.laroche@imtek.uni-freiburg.de.

Jonathan Laroche

Research Associate

Laboratory for the Design of Microsystems, Prof. Dr. Peter Woias

IMTEK – Department of Microsystems Engineering

universität freiburg