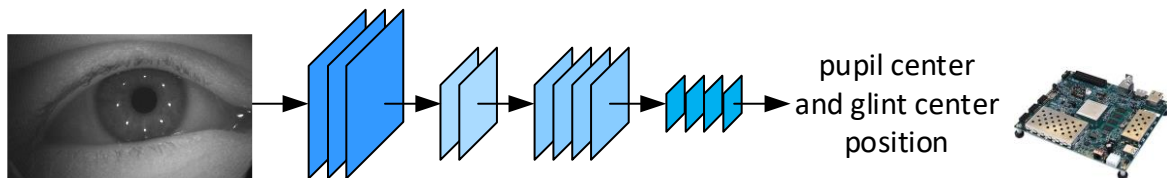


## Master Thesis

Embedded image processing and analysis close to the image sensor is gaining more and more momentum since it allows to reduce required communication bandwidth to the next layer of the processing hierarchy. This saves energy and enables significant efficiency improvement for the consumer industry. Image processing on a smart image sensor not only comes with benefits but also includes technical challenges.

The focus of this master thesis is on the design and implementation of a neural network for a pupil detection application. This application is integrated into a smart image sensor with limited resources. Detection accuracy and efficiency in terms of memory usage and execution time are of utmost importance in this context. Furthermore, the neural network should be trained and tested.



Student Target Groups:

- Target of this master thesis is the development of a small neural network for pupil detection on a microcontroller as part of a smart image sensor. The neural network should be quantized and evaluated. The neural network should be trained and tested. Students of ICE/Telematics, Informatics

Thesis Type:

- Master Thesis

Required Prior Knowledge:

- Good programming skills (C/C++, Python)
- Basics of Machine Learning
- Basics of image processing

Goals and Tasks:

- Design and Implementation of a neural network for pupil detection.
- Performance analysis and tests of the neural network on an embedded processor.

Contact:

- Gernot Fiala ([gernot.fiala@tugraz.at](mailto:gernot.fiala@tugraz.at))