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## PRACTICAL COURSE

### **SpikeLink - an extensible AER hub based on a multi-core microcontroller**

#### Problem description:

A tenet among modern neuromorphic computing architectures is a communication system that provides scalable spike event transport with low overhead. Similarly, neuromorphic sensors transmit sensory data in an Address Event Representation (AER). Unfortunately, there is no universally accepted standard for the physical or logical communication protocol, so different neuromorphic sensors and computers implement AER transports in different ways. In a recent Bachelor thesis N. Ahmed has developed the proof-of-concept of a flexible, easy to use, and easy to extend hardware interface that can act as a hub between different neuromorphic and non-neuromorphic sensors and computers. The interface is based on an xCORE multi-core microcontroller by XMOS<sup>®</sup> Ltd. The special architecture of this microcontroller allows for the efficient implementation of new interfaces in software.

#### Tasks:

The main tasks of this practical are to

- familiarize with the SpiNNaker Link interface and the existing implementation on an xCORE microcontroller
- refactor and modularize the existing code base to make it user friendly and easily extensible
- create a self-explaining build system with as little dependencies as possible
- demonstrate and document at least 2 example projects using SpikeLink and SpiNNaker in robotic settings

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