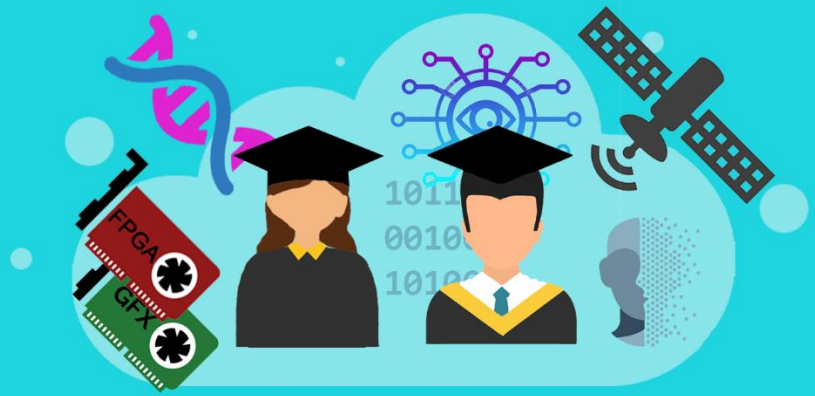


# Diploma Thesis

Microprocessors and  
Digital Systems  
Laboratory



## PYTHON MODULE FOR BRAIN SIMULATION

PyNN, a new, Python-based, simulator-independent language provides a common front-end (API) for various legacy neuromodeling software simulators such as NEURON and GENESIS. The PyNN framework is extensible with custom simulator back-ends, as demonstrated within the FACETS project (ASIC-based simulator). There is need for a familiar coding front-end for implementing brain models which could then be executed on fast accelerator platforms.

In this work, we want to bring the benefits of two worlds together: (a) the ease of use (and established user base) of PyNN for modeling realistic brain models with (b) the staggering simulation speed that accelerators can deliver in the field of brain simulation.

The student is expected to study PyNN's existing API's and develop a generic backend mapping of PyNN neural models and establish inter-process communication between the API's for (dynamic) mapping of PyNN models to a free-running, brain-simulation engine.

### PREREQUISITES

Good knowledge of Linux, C, C++, Python;

### OPTIONAL

Web / network interfaces.

### KEYWORDS

Computational neuroscience, neuronal network model, neuronal network simulator, Python interface.

### EXTRA INFORMATION

[Pynn](#), simulator-independent language for building neuronal network models.

[Human Brain Project \(HBP\)](#)

[Neurasmus B.V.](#)

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