



Opportunities
for Talents

Lehrstuhl für Schaltungsentwurf
Fakultät für Elektrotechnik und Informationstechnik
Technische Universität München



Neural Networks for Ion-Selective Sensors

Internship Offering at the Chair for Circuit Design
FP / IP / BA

Motivation:

Driven by digitalization, the internet of things (IoT) and other digital megatrends, a massive amount of data is collected these days and artificial intelligence is more and more necessary to generate value out of these large data sets. One IoT-application can be Ion-selective sensors which can detect anomalies in human sweat and can improve physical performance. These sensors must be small and cheap to make a big application field possible. Due to the small form factors these sensors are rather imprecise and need AI-learning algorithms to generate real meaning in the measured data.

Electronic Tongue Principle

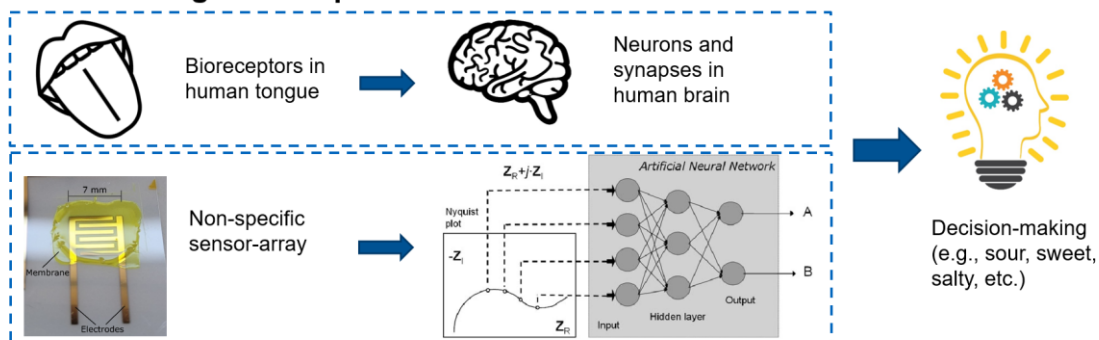


Figure E1: Non-specific sensor array correspond to taste buds. Artificial Neural Network corresponds to synapses and neurons in the human brain. The result in both cases is the classification of sample under test.

What does the work look like?

The work will be done at the chair of circuit design. Starting from some literature research on the topic, you should get familiar with the working principle of the sensors to understand the already measured sensor responses. These data traces must be read in with python. After some pre-processing the data can be fed to an already existing neural network and different output classes should be predicted. By using different parameters in the learning process the accuracy of the neural network should be improved and the influence of different parameters evaluated.

What are good pre-requisites for starting this work?

- BSEI/MSEI/MSCE/MSPE study focus towards design of electronic circuits and systems
- Some knowledge in Machine Learning Algorithms is preferred.
- Some experience in Python or other programming language is preferred (Lab/Lecture)
- Highly interested in biologically inspired systems and neural networks

Interested?

→ contact:

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