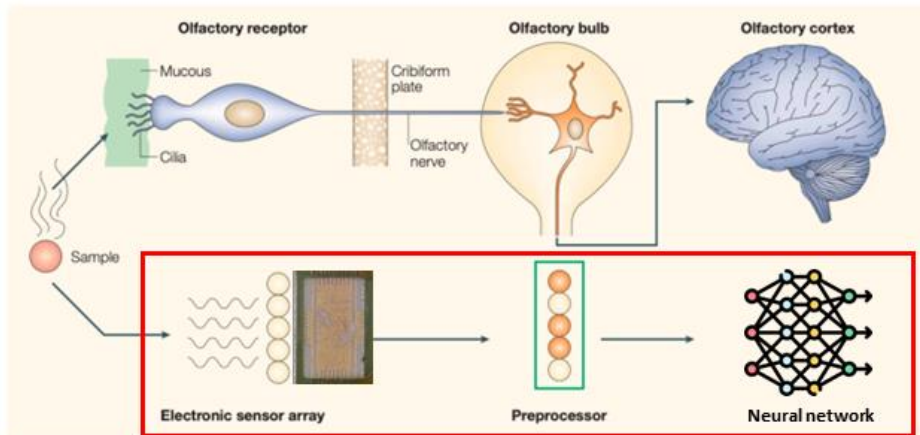


## Master / Bachelor Thesis

### Neural Network Implementation for Electronic Nose



### Motivation

With the increasing demand for real-time and non-invasive detection of various compounds, the development of electronic noses has gained immense importance. By integrating neural networks, this work aims to improve the precision and speed of electronic noses, enabling more accurate and efficient detection and differentiation of gases and volatile organic compounds. The successful implementation of this technology could have numerous practical applications in industries such as healthcare, environmental monitoring, and food safety, making it a highly relevant and impactful area of research. This thesis offers a unique opportunity for students interested in the intersection of technology and science to contribute to an emerging field and make a valuable contribution to scientific knowledge.

### Tasks

Your main task will be to implement a neural-network-based machine learning algorithm for our existing electronic nose (e-nose). For this classification task, first a suitable network design has to be found. Next, network parameters have to be optimized. And finally, your algorithm will be compared with the existing method (linear discriminant analysis).

### Prerequisites

- Proficient in python
- Independent and reliable work
- Open communication and teamwork
- Students of mechatronics, electrical engineering, computer science or comparable topic

### Research Areas

Machine learning,  
computer science,  
electrical engineering  
sensor technologies

### Type of Work

Mostly theoretical

### Location

LTI  
(KIT, Campus South)

### Starting Date

As soon as possible

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