

## 3D Object Detection through Machine Learning and Deep Learning Methods

In co-operation with PFW Aerospace and in the framework of Industry 4.0, automation of warehouse tools and component parts are explored. In this context, 3D object recognition and classification methods for component parts are being developed.

There are different approaches present for recognition and classification of 3D objects. The most classical approach has been pattern matching. The recent advances in the field of machine learning and deep learning have enabled their widespread application. In this industry co-operation project, we will apply state-of-the-art deep learning and machine learning techniques to recognize and classify 3D objects using high-resolution and high-quality 2D images.

We are looking for HiWi students to support us in the following

- Setup a workstation to capture high-resolution and high-quality 2D images of 3D objects
- Process the captured images to remove the noise and improve the image quality
- Build & train a deep neural network (DNN) model for object recognition and classification
- Experiment with different multiple 3D objects and record the observation

The duration of HiWi is for minimum six months and an extension is possible.

### Requirements:

Students with a background in computer science, mathematics, electrical engineering, or other engineering majors are welcome to apply. Pre-knowledge in image processing, and neural networks is a plus point. Strong self-motivation, reliability, and critical mind are expected.

### Emphasis:

Theoretical Study	
Software Implementation	
Hardware Implementation	

### We offer:

- excellent support and advice
- highend infrastructure
- contact to industry and research partners

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