

Markus Knitt  
E-Mail: [markus.knitt@tuhh.de](mailto:markus.knitt@tuhh.de)

Hamburg, 25.04. 2024

## Final/Project thesis at the Institute of Logistics Engineering

Title: Synthetic Dataset Generation for Object Recognition and Material Classification

In the world of artificial intelligence and machine learning, high-quality datasets are crucial for the development and success of object recognition and material detection algorithms. This thesis offers the opportunity to make a significant contribution to the creation of such datasets by generating synthetic data and using it for these purposes. The aim of the thesis is to generate datasets for AI-based object and material recognition algorithms with the help of a simulation environment.

### Task definition:

- Research and identification of relevant dataset requirements
- Generation of synthetic image data corresponding to real scenarios and objects, taking into account both objects and materials
- Validation of the datasets and comparison with datasets based on real image data

### Requirements:

- Students of engineering or computer science
- Interest in computer vision and machine learning
- Good programming skills