

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

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## Task description for thesis at the Institute of Logistics Engineering

Title: Leveraging Scene Understanding Models for Augmenting Empirically Generated AI Datasets

In the field of artificial intelligence (AI), data sets play a crucial role in the development and validation of machine learning models. In order to train high-quality AI models, the availability of large and diverse data sets is of great importance. This thesis aims to develop a concept for augmenting empirically generated AI datasets by integrating data for object and material detection.

### Task definition:

- Research on methods for scene understanding, object and material detection using image data
- Integration of object and material data into existing empirically generated AI data sets
- Implementation and testing of the developed concept, using suitable programming languages and frameworks
- Validation of the extended data sets with regard to their suitability for AI modeling and validation

### Requirements:

- Students of computer science, electrical engineering, mechanical engineering
- Interest in artificial intelligence and machine learning
- Good programming skills, preferably in Python
- Familiarity with image processing and sensor technologies is an advantage