

Active Perception of Deformable Linear Objects in Robot-Based Assembly (SA/FP/IDP/MA)

Motivation

At the iwb, research is being conducted on the robot-based assembly of deformable cables in order to improve ergonomics, quality, and efficiency. Branched cable harnesses are typically only partially visible, so a single camera view rarely captures the information needed for reliable automated assembly.



Objective

The aim of the thesis is to develop an active perception approach that builds an understanding of branched cables step by step and plans where to look next in order to complete the information required for assembly.

Possible Tasks

- Literature review on the perception of deformable linear objects
- Detection of topological key points such as branch and end points
- Matching of partial observations to the known cable harness topology
- Gap analysis of the topology
- Planning of promising next camera views under robot reachability constraints
- Validation of the perception pipeline at the robot setup

Requirements

- Structured way of working
- Good programming skills
- Ability to solve problems independently

Contact

M. Sc. Celina Dettmering
Department
Assembly Technology and Robotics
Celina.Dettmering@iwb.tum.de