

Multimodal Error Detection in Robotic Assembly (SA/FP/IDP/MA)

Motivation

The iwb researches the robotic assembly of deformable linear objects such as cables. Errors appear in different signals – acoustics, force/torque, camera images, and poses. Every single modality detects only part of them, so a synchronized multimodal approach is needed.



Objective

Integrate acoustic, force/torque, vision, and pose-based error detection into one system that handles errors autonomously.

Work Packages

- Literature review on multimodal sensor fusion
- Develop a Synchronization strategy for the asynchronous sensor streams
- Define a common interface and event format for all detectors
- Decide on a fusion logic for cross-modal error hypotheses
- Link fused detections to recovery skills
- Benchmarking single-modality vs. multimodal detection and validation at the robot cell

Requirements

- Structured way of working
- Good programming skills (Python, ideally ROS)
- Independent problem-solving skills

Contact

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