

Topic:

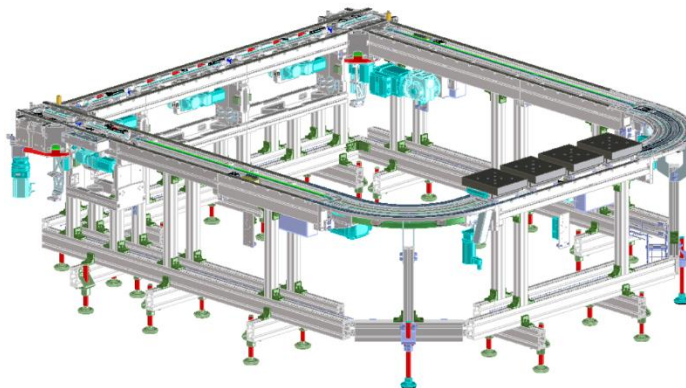
Suitability of Ultra-Wideband Real-Time Localization Systems in Industrial Environments

Motivation:

Ultra-wideband (UWB) technology is one of the most promising techniques for indoor localization offering high accuracy, low power consumption, and resilience against interference. However, there is a lack of research on how it can be integrated into challenging industrial environments.

In this thesis, UWB localization shall be used to locate and identify workpiece carriers within a transport system. A localization system based on custom sensor nodes shall be adapted in terms of firmware (e.g. communication protocol) and set up at a partner's facility. Mounting positions for both static nodes on the transport system and moving nodes on the workpiece carrier have to be defined in order to minimize non-line-of-sight conditions.

The localization performance shall be assessed with a focus on the correct detection of the workpiece carrier order. At discrete positions, the transport system is capable of providing location information, which can be used as reference. The main goal is to evaluate the localization accuracy that can be expected from an UWB system in harsh environments.



Tasks:

- Literature research suitable commercial UWB systems
- Adapt and set up a localization system at the company partner's facility
- Acquire measurements on a real transport system
- Refine localization algorithm e.g. by assessing additional sensory
- Evaluate the system in terms of localization accuracy

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