

## Bachelor's/Master's thesis

# Safety requirements analysis for machinery in intralogistic applications

### Scope:

Future material handling and production systems will be open and adaptive, posing challenges for all layers, from the high-level IT-systems down to the machine control systems. A new integrated mixed-criticality controller is being developed in the ZIM-Project FOLSA ("Future oriented logistics safety application") by IFL together with project partners. The controller is aimed as an embeddable device for various material handling equipment, enabling safety functionality combined with IoT-communication capabilities in a compact form.

### Problem statement:

The main task in this thesis work is to study the safety requirements for various material handling equipment. After identifying and categorizing typical safety functions and current solutions, common patterns overlaying the various applications should be identified. The aim of the work is to have an understanding of the common patterns for safety functionality in material handling machinery.

### Tasks:

- Literature study: State-of-the-art in machinery safety through standards and publications
- Case study/studies: Safety requirements for a group of material handling equipment: Existing standards, typical risks, common safety functions and their implementations, identifying typical information flows (effect of security on safety)
- Identifying common patterns and solutions
- The depth and breadth of the thesis work can be adjusted for both Master's and Bachelor's thesis.

### Required:

- Interest in safety-related machine control systems
- Independent and structured way of working

### Offered:

Possibility to work in the interesting field of safety-related machine control systems, with a view into current research problems.

The thesis can be written in either English or German.

### Faculty:

Safe mechatronic systems in intralogistics

### Thesis focus:

- ☒ Safety technology
- ☐ Experimental
- ☒ Theoretical
- ☐ Practical
- ☐ Simulation
- ☐ Construction
- ☐ Graphical design

### Study programme:

- ☒ Mechanical engineering
- ☒ Mechatronics
- ☒ Electrical engineering
- ☒ Computer science
- ☐ Infonomics
- ☒ Industrial engineering

**Begin:** As soon as possible

### Announcement date:

02/2018

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