

## Abstract

Combined hardware/software systems evolve like every other system and frequently without sufficient documentation. Changing or improving the system becomes more difficult over time. The situation becomes even more complicated, if hardware and software components of different vendors are combined on-site of their application. This thesis presents a high-level domain-specific reverse and forward engineering method for airport baggage handling systems. The re-engineering part serves to analyze a current situation and the forward engineering part serves to match the re-engineering results with desired quality criteria of a new proposed system. The re-engineering part seamlessly feeds into the (forward) engineering part. The method is applied using a large case study, the current baggage handling system at the Kuala Lumpur International Airport.

## Expected Results

- Literature review
  - Review and discussion of literature on
    - reverse engineering combined hardware/software systems
    - baggage handling systems
- Method definition
  - Description of the proposed method for reverse and forward engineering
  - Motivation of the proposed method by review of application challenges
  - The reverse engineering part allows to capture the existing complexity of hardware and software components and their interactions
  - The forward engineering part allows to capture the complexity of the future proposed system, including all future components and their interactions, and how existing components are migrated to these new components
- Application of method
  - To show-case its usefulness the method is applied at the KLIA
  - Reflections and experiences are presented and the method's effectiveness is discussed

## Supervisor

Prof. Dr. Dirk Riehle

Friedrich-Alexander University

[dirk.riehle@cs.fau.de](mailto:dirk.riehle@cs.fau.de)