



Bachelor Thesis Proposal

Data Acquisition and Synchronisation System

Embedded Mechatronic Systems (Prof. Schütz) - Project EmKIPro²

Published on 23.07.2026

Background

The main idea of the EmKIPro² project is to develop an innovative leg prosthesis that uses artificial intelligence (AI) to provide users with precise feedback on movements and environmental conditions. To do so, multiple sensors will be integrated into the foot. These include, but are not limited to, strain gauges to measure the foot deformation and one or more IMUs to determine the gait phase. Combined with these sensors will be the experimental environment which will have its own set of sensor and measurement devices such as force plates, a motion capture system, pressure mats, and a treadmill.

Project Description

In order to properly parse, visualise, manipulate, and validate the data, a data acquisition system needs to be developed. This system should synchronise the data coming from the various sensors both embedded onto the prosthetic foot as well as external testing data. It should also be modular to allow for the addition or removal of sensors as the project develops.

Preliminary Tasks

Below are some example tasks that the student will have to perform. These tasks can be discussed and expanded to best fit the needs of the project and the interest of the student.

- Research data acquisition and synchronisation systems
- Become familiar with the different sensors, how they function, what data they acquire, ...
- Synchronise the data from multiple sensors
- Create a visualisation application with all the available data
- Document the process
- Write the thesis

Contact

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