

# Paid Master's Thesis

## Model Predictive Control of Hydrogen Technologies

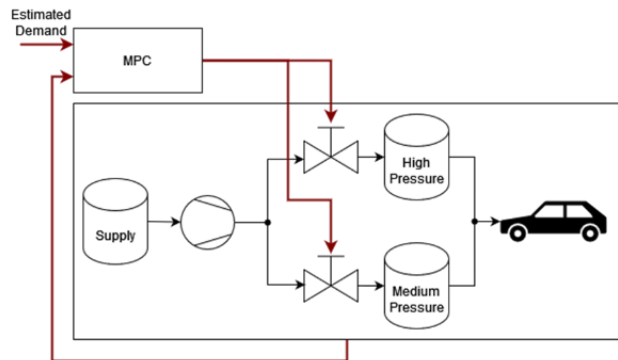
To dedicated students (m/w/d) of digital, electrical, mechanical, information and computer engineering, or related disciplines we offer the opportunity to write a **paid Master's thesis**.

### Objectives:

**Hydrogen technologies** (e.g. electrolyzers, gas tanks, fuel cells, ...) have become increasingly important in recent years.

However, **optimal control** of such systems comes with a challenge, as the explicit consideration of pressure and mass flow require **non-linear models**.

The goal of this thesis is to investigate and compare different modelling approaches, on the example of an H<sub>2</sub>-charging station, for use in a **model predictive controller** (MPC).



### Objectives:

- Investigation of different modelling approaches (linear, non-linear, integrator-model, physically-motivated, ...) for prediction of hydrogen production, demand and distribution
- Implementation of selected models for hydrogen technologies in Matlab/Python/Julia
- Implementation of an H<sub>2</sub>-charging station and evaluating the different modelling approaches for usability as MPC strategies
- OPTIONAL: Additional modelling of logistics/distribution constraints for the MPC

### Your profile:

- Studies in digital, electrical, mechanical or information and computer engineering, etc.
- Basic knowledge of a programming language like MATLAB, Python or (ideally) Julia
- Basic knowledge of control engineering and optimization

### Our offer:

- Integration into a dedicated team with good support
- Flexible working arrangements
- Perspective of participation in follow-up projects after successful completion
- Financial compensation based on student staff salary scheme
- Remote work from home is possible

**Start date:** from 01.02.2024 (duration: 6 to 8 months)

### Contact us:

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**We are looking forward to receiving your application including your CV, a list of the courses during your studies and a transcript of records.**