

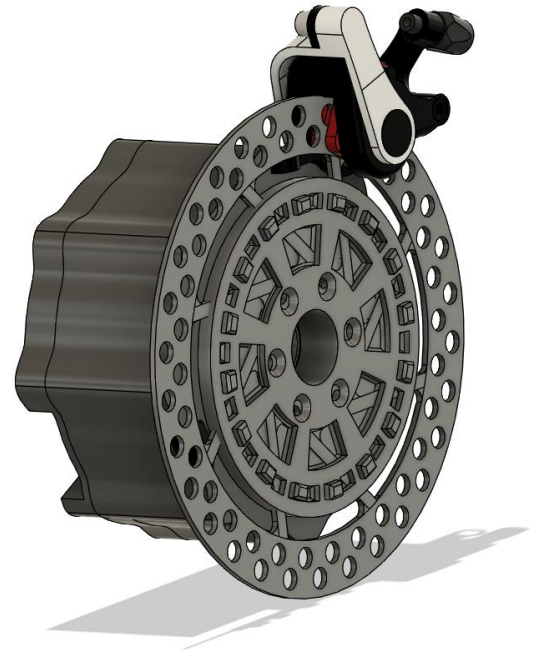
Thesis – Actuator Integrated Brakes

Design & Prototyping

Advances in artificial intelligence and robotics are rapidly transforming how autonomous systems perceive, navigate, and interact with the world. However, mobile systems are severely limited in these applications by means of energy supply. This could be tackled by making systems more energy efficient.

Basic Thesis Concept

Integrated brake/lock mechanisms are surprisingly rare in mobile robotics. However, they offer high potential to save energy, reduce thermal load and make robots safer to interact with humans. The general goal of this thesis is to develop and test one or multiple braking/locking systems for a new robot, which is being built at IMI. The brake system should be integrated into a custom actuator housing.



Braking Mechanism

- Test and compare different potential braking mechanisms
 - Electromagnetic brake
 - Mechanic disc brake
 - Pin-based locking systems
 - Torque limiters
 - Clutch mechanisms
- Integrate braking system at our actuator test bench into a custom actuator housing
- Run different tests to evaluate energy saved, reduction of thermal loads on the actuator etc.

Skills

- Experience in design and prototyping
- CAD (ideally Fusion 360, but others are sufficient)
- FEA (not necessary, but could be an interesting design evaluation tool)
- Python programming (only basics, might be necessary for test bench evaluation)

Do you want to work on cutting edge robotics research?

Type: Master Thesis

Date: As soon as possible

Supervisors: Prof. Dr.-Ing. Arne Rönna, M.Sc. Björn-Felix Dettmar

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We look forward to receive your application (inc. current grade transcript)!

