Master's Thesis:

Energy Recovering Control Strategies on a Battery Electric Telehandler

Contacts

Mia Asplund
HR-manager
mia.asplund@parker.com

Mobile Application Centre, Borås
Erik Forsberg
Engineering Manager
erik.forsberg@parker.com

Mobile Application Centre, Borås
Bohan Liang
Systems Engineer, thesis supervisor
bohan.liang@parker.com

About Parker Hannifin

Parker Hannifin is a world leading diversified manufacturer and designer of advanced technology product and solutions; we depend on the dedication, innovation, diversification and contribution of all our employees and always rise to challenges courageously.

Parker Hannifin AB, Mobile Application Centre, in Borås develops system solutions for our Mobile OEMs in Europe focusing on Hydraulic systems, electrification systems and controls systems.

Opportunities at Parker Hannifin

Parker Hannifin has a long history of working with academia. We continuously offer students:

- Trainee programs
- Master thesis
- Internships
- Summer jobs
- PhD projects

If you have own ideas of Master Thesis, please contact us.

www.parker.com

Background

Parker Hannifin is a world leading diversified manufacturer and designer of advanced technology product and solutions. Electrification solutions is one of our strongest portfolios, and we are thrived to have you onboard towards a sustainable future. Within electrification of mobile machineries, battery sizing remains a significant challenge balancing between guaranteed performance and unit cost. Energy optimization is a key enabler to cost-effective machines. One piece of the puzzle to increased system efficiency is energy recovery.

Objectives

In this thesis project, the students will:

- Study the operational principals of hydraulics and control systems on a battery electric telehandler.
- Establish simulation model of systems on which energy recovery shall be performed.
- Design and evaluate control strategies for energy recovering scenarios (e.g., when lowering a load), whilst maintaining same or better performance and safety of a conventional machine.

Activities

- Literature studies
- Develop simulation models, control algorithms, and duty cycles for benchmark.
- Implement and verify functions on the telehandler, on-site at Parker Hannifin AB, Mobile Application Centre, Borås
- Apply control strategies and quantify efficiency gained.

Miscellaneous

The project is suitable for one or two students (preferably) with the ability to work independently and creatively. Job location is flexible with occasional travels; we do however encourage students to work side by side with us on-site. Suitable background is a master's program in Mechanical Engineering (Maskinteknik) within Hydraulics/Mechatronics and/or Applied Physics (Teknisk fysik) within Control Systems/Mechatronics. A strong interest in modelling, simulation, automatic control and simulation-based optimization is required.