

AUTOMATIC STEERING WHEEL SYSTEM FOR TRACTORS

Damian K. Cieplak, Daniel R. Teijeiro, Mads G. Andersen and Kasper H. Berthelsen

¹Department of Materials and Production, Aalborg University
Fibigerstraede 16, DK-9220 Aalborg East, Denmark

Email: {[dciepl21](mailto:dciepl21@student.aau.dk), [dteije21](mailto:dteije21@student.aau.dk), [madand18](mailto:madand18@student.aau.dk), [kberth18](mailto:kberth18@student.aau.dk)}@student.aau.dk, web page:
<http://www.mechman.mp.aau.dk/>

Keywords: Tractor, Autopilot, Design, Steering Wheel, Farming, Electric Motors, Optimization

ABSTRACT

Agricultural farming is an exhaustive task and leaves farmers fatigued during harvesting seasons. As the fatigue level of the farmers increase, the yield efficiency decreases, and the risk of injuries grows [1]. As there is an increased focus on optimizing the yield efficiency of farming, different technologies that assist this have been developed.

Technologies like self-steering wheels that enable the tractor to be autonomous at certain levels have been developed to assist farmers when driving tractors such that the long working hours become less fatiguing. Furthermore, these technologies allow the farmers to operate efficiently in conditions with poor visibility and optimize the yield efficiency as the amount of overlap can be minimized.

The focus of the paper is to design, optimize and test an electrical self-steering system which can be easily implemented in different tractors. This includes measuring and modelling of the loads, which act on the steering wheel during different operations and building a test-setup which can replicate the loads of operation.

The final design of the system might have multiple variations, whereas the variation to actually be constructed and tested might be tailored for a specific motor provided by the Energy department at AAU University.

Acknowledgement

The authors of this work gratefully acknowledge Grundfos for sponsoring the 10th MechMan symposium.

REFERENCES

- [1] FHadmin, 2021. FHadmin. Fatigue, 2021. URL
<https://farmerhealth.org.au/2017/03/20/fatigue>. urldate: 10/02-2022