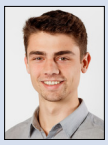

Florin
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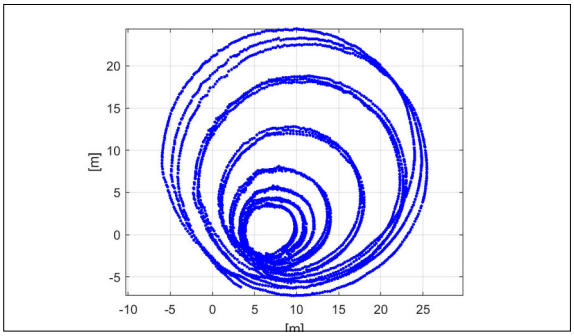
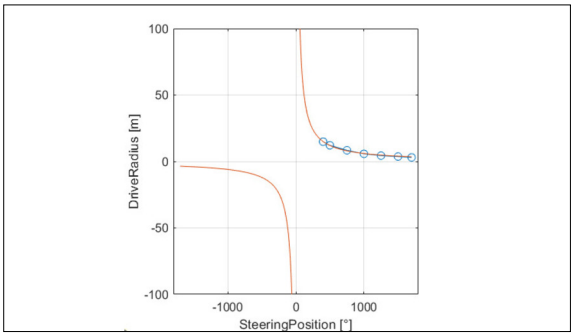
Subject Area	Mechatronics and Automation

Integration of Subsystems and Improvement of the Weederazer



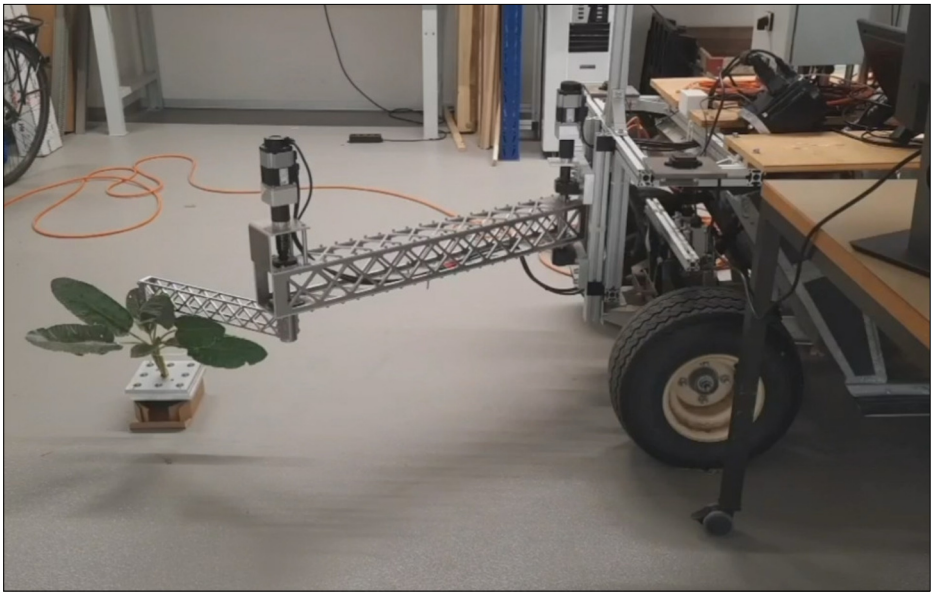
Measurements of circular trajectories to determine correlation between steering and trajectory
Own presentment



Fitted Function to measurements used for the Pilot control
Own presentment

Introduction: In this project, the integration of an existing SCARA system into the existing WeedErazer was accomplished and further improvements to the combined system have be made. To improve the accuracy of the previously implemented navigation system, the steering system was reworked. This meant that a new controller concept was implemented that could handle PID and pilot control for the steering axis. The rework was necessary as quick consecutive commands were previously not possible due to boundaries of the implementation. To realize the pilot control, an experimental model was measured, implemented and supplemented with a PID control. The gained insight from this improvement on the steering controller allowed for better integration of the SCARA system. The motor controllers for the robot axes were adapted to the new, faster controller concept, the subsystem restructured and the interface from bordcomputer to SCARA robot has been simplified. The robot has further been improved with smoother trajectories and a more error resilient implementation.

Conclusion: The overall conclusion is that the subsystems have successfully been fused, the steering was improved by faster reaction and a pilot model, the SCARA improved with smoother action and the PLC implementation was shortened by 8'000 lines of code. The system is not field tested in its final state. Field tests were carried out after the first step in fusing the subsystem was accomplished. The steering controller and the SCARA controller are only tested under lab conditions without navigation. Further steps would therefore include testing of the navigation with the new steering controller and tuning the error correction of the drive trajectory.



SCARA system after starting the jobHandler indoors without navigation
Own presentment