

## Master Thesis Beckhoff Automation

Beckhoff Automation is a global provider of open automation systems based on advanced PC Control technology. The “New Automation Technology” philosophy at Beckhoff represents universal and open automation solutions used in a wide spectrum of high-tech applications around the world.

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## Path planning algorithm for levitating planar motion system

Beckhoff XPlanar is a new revolutionizing motion system that uses magnetic levitation to transport movers with products above tiles that creates a magnetic field. By leveraging Beckhoff’s powerful technologies such as the software TwinCAT 3 and the fieldbus EtherCAT G together with machine learning we are able to have a position resolution of the movers of 1µm and repeatability of 50µm with speeds up to 2m/s.

This project aims to examine the possibility of incorporating a path planning algorithm into the XPlanar system with focus specifically for a static scenario such as the start-up of the system.

There are multiple proven approaches in the field of motion planning and your task will be to review different algorithms and choose one or multiple algorithms based on a set of criteria. We have no specific requirements on chosen approach and you are allowed to freely choose your preferred development tools such as Matlab/Simulink, Python or any other.

The project can be split into multiple goals

- Choose and implement an algorithm that allows movers spread all over the system to line up, one by one, on a specified path while avoiding collision.
- Optimize solution with respect to time
- Extend the solution to line up all movers simultaneously

Scan the QR code in the bottom-right corner to visit our website and see the XPlanar system live on videos, we assure you that you will be impressed by this new revolutionizing technology.

For a successful project we offer you.

- TwinCAT courses to learn our software
- A XPlanar system for practical tests
- Relevant software for offline tests
- Supervisor in Malmö
- A workplace in Malmö

