Masters Thesis: Model Building for Modular Industrial Robots

Masters Thesis · Informatics, Mechanical Engineering, Robotics · Fulltime · HQ

The thesis is offered in cooperation with the chair of Robotics, Artificial Intelligence and Real Time Systems, professorship for Cyber Physical Systems of Prof. Dr.-Ing. Matthias Althoff.

YOUR MISSION

You'll be analyzing robot hardware from the ground up to build a fully modeled virtual twin of it, considering all kinematic and dynamic properties and possible errors. You will use that model and twin to improve the robot's movement performance and gain insights into what effects matter and which can be controlled. As part of the engineering team you'll be part of an experienced team, working on the forefront of industrial robotics. You'll work as part of the team with your own responsibilities. Parts of your work may include the following:

- Analyzing modular industrial robots,
- Building and verifying a precise kinematic, dynamic and electromechanical model,
- Parts of that may include: Friction modeling, gear modeling, motor modeling, temperature dependency modeling,
- Improving robot performance and precision,
- Developing feed-forward strategies to make use of the model,
- Introducing artificial model errors,
- Evaluating the severity of different effects.

YOUR PROFILE

- You're studying at TUM with a focus on computer science, mechatronics, or electrical engineering.
- You have worked with robotics, control theory, model building before.
- You know C++ and Python really well.
- You want to gain real world experience during your masters thesis.
- You love to take responsibility.
- You're not scared of screws and bolts.

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