Master's thesis (m|f|d)

Automatic generation of motion models from GPS and IMU sensor data

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Our Passion - Be a part of it!

Originally as a research project, indurad has been developing innovative sensor solutions for the world's leading raw materials industry since 2008. From our headquarters in Aachen, our team of 150 fantastic employees ensures that our high-quality solutions lead to greater safety and lower greenhouse emissions in the bulk solids and raw materials industry around the globe. indurad combines the dynamism of a start-up with the energy and ideas of a large corporation - that's what makes us so unique! We are a diverse team of talented, innovative people focused on making positive change happen on a large scale.

Develop algorithms that understand machines

How does a construction machine weighing several hundred tons move?
And can an algorithm learn how its mechanics work based solely on sensor data?

This is exactly the question we're working on at indurad.
Our sensor solutions are used worldwide in the raw materials industry to operate large machines more safely, efficiently, and sustainably. To do this, we need to understand precisely how machines move in space.
Currently, every machine is measured in a labor-intensive process—one that consumes a lot of time and resources.

Our idea:

To develop a method that automatically learns how a machine moves based on GPS and IMU sensor data and uses that information to independently create a kinematic model.

Your goal:

- Development of a method that automatically calculates a machine motion model from recorded GPS measurement points (and optional IMU data)
- Formulation of a mathematical optimization problem for reconstructing joint angles and degrees of freedom
- Evaluation of various solvers and numerical methods
- Analysis of the extent to which IMU data improves model accuracy
- Validation of the developed method using real machine projects
- Comparison of the results with existing measurement models

What should you bring?

- You are currently pursuing a master's degree in mathematics, physics, or a comparable science or engineering program.
- You have a strong understanding of mathematics, particularly in the areas of optimization, numerical analysis, or kinematics;

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- You already have practical experience with C++ and/or Python;
- You are interested in mathematical optimization, data analysis, and algorithmic modeling;
- Ideally, you have some initial experience with GPS or IMU sensor data;
- You work independently, in a structured manner, and with a high degree of initiative;
- You feel comfortable in an international environment: You not only have good German language skills but also good English language skills and are not afraid to use them.

What do we offer you?

- We offer a fair stipend of €1,000 per month for your master's thesis.
- You'll be mentored by experienced software developers and work as a full-fledged member of our team.
- You'll have plenty of room to contribute your own ideas and the opportunity to independently develop and implement your own solutions.
- Early bird or night owl—thanks to flexible work schedules, you can structure your workday yourself.
- We offer you a workplace where you'll feel right at home: bright, modern offices, ergonomic equipment, beverages, free parking, and plenty of room for initiative and growth opportunities—all of this is important to us so that you feel completely at ease!
- Direct access to management and supervisors, open communication, a supportive team environment, and a casual dress code are just as important to us as a culture where everyone is on a first-name basis

Perfect Match?

We want to make this as easy as possible for you! Our recruiting expert, Bianca Just, looks forward to receiving your resume (max. 5 MB), including your preferred start date, via email at job@indurad.comor through our online application form.

You can find more job openings at our careers page.