Bachelor-/Masterthesis/IDP/FP/IP

Technische Universität München

EI MST

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Lehrstuhl für
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Development of IIoT-Platform for connected Industry 4.0 in wind power platforms

The next wave of innovation in wind energy is powered by sensors and information. In the next decade, every new rotor blade will be equipped with several sensors that allow a direct measurement of the structural parameters. The operation of wind turbines and parks can be significantly optimized with the help of moments, frequencies and forms resulting from sensor signals. In a Multi-sensor data fusion approach, the combination and processing of fragmentary and sometimes contradictory sensor data into a homogeneous overall picture of the current situation that can be used to boost the yield of a wind power platform. By connecting industrialized measurement controllers to cloud computing, raw data of different sources are uploaded, analyzed and interpreted in context of industry 4.0 to optimize yield, schedule predictive maintenance and lower operating costs of single turbines or even whole wind parks.

fos4X, a spin-off of the TUM MST, is developing such IIoT-enabled systems for the wind industry. In context of this subject cutting edge technologies need to be employed in the field of data engineering and analytics and in empowering small devices (microcontroller-based as well as edge computers running Linux) to integrate into existing or new IIoT infrastructures.

The proposed scientific work may involve:

- Implementing advanced self-test and diagnosis capabilities in embedded devices
- Integrating new IIoT protocols into the embedded device firmware
- Developing real-time data processing algorithms for data fusion or validity checks e.g. in python or embedded C / C++
- Enhancing monitoring solutions for fos4X edge devices using IIoT and cloud technologies
- Improving visualization and dashboarding solutions

The activities will take place at the company fos4X, Munich. The work also offers a good balance between theory and practical development.