



Technische Universität München



Institut für Informatik VI  
Robotics and Embedded Systems

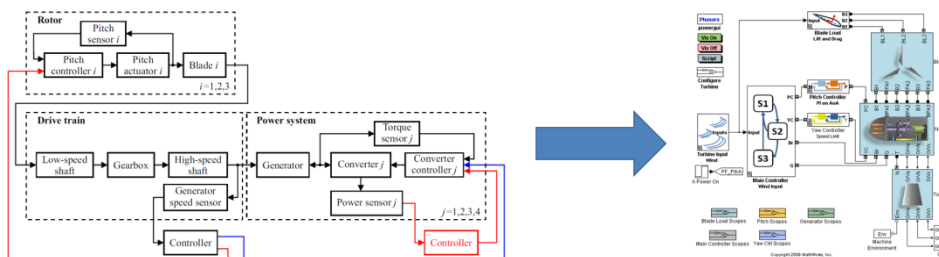
## BA/MA/Dipl-Thesis: Development of a simulation model for modern wind turbines

### Background

Over the past few years, wind energy has shown the fastest rate of growth of any form of electricity generation. Offshore wind parks have shown many advantages such as reduced environmental impact (both visually and acoustically) as well as lower wind turbulence with higher average wind speeds. Because of special conditions at the remote locations, many aspects of the traditional wind turbine systems have to be reconsidered to guarantee the reliability and the availability of the systems.

### Description

As foundation for the research project at the chair, a wind turbine model will be built in Matlab/Simulink. This model should provide equivalent characteristics to those of a real wind turbine. An interface for fault injection should be implemented to simulate the faulty systems, which will be investigated in the next step of the project. At last, some fault detection algorithms for sensor faults should be designed to evaluate the models. The simulation model shouldn't be built from the scratch but base on some existing models.



### Tasks

This student project consists of the following tasks:

- Review of currently available simulation models of wind turbines
- Design and Implementation of a simulation model of wind turbines in Mat-lab/Simulink.
- Implementation of fault injection interface for the above model
- Implementation of simple fault detection algorithms to verify the model.
- Testing and documentation of the developed software components.

### Literature examples:

- Matlab Wind Turbine Model: <http://www.mathworks.com/matlabcentral/leexchange/25752-wind-turbine-model>
- Peter F. Odgaard, Jakob Stoustrup, Michel Kinnaert - Fault Tolerant Control of Wind Turbines a benchmark model. In Proceedings of Fault Detection, Supervision and Safety of Technical Processes (June 2009).

For more information, please contact Binh An Tran via mail ([tranb@in.tum.de](mailto:tranb@in.tum.de)) or phone (+49.89.289.18126).

#### Supervisor:

Prof. Dr.-Ing. Alois Knoll

#### Advisor:

Dipl.-Ing. Binh An Tran

#### Research project:

WIND

#### Type:

SEP/IDP/BA/MA

#### Research area:

Embedded Systems

#### Programming language:

Matlab

#### Required skills:

Matlab

#### Language:

english/german

#### Date of submission:

TBA

For more information please contact us:

Phone: +49.89.289.18126

E-Mail: [tranb@in.tum.de](mailto:tranb@in.tum.de)

Internet:

[www6.in.tum.de/Main/Tranb](http://www6.in.tum.de/Main/Tranb)