Bachelor / Mini / Master Thesis

Generation of Artificial Statistical Microstructures using Generative Adversarial Networks (GAN)

The Project

In modern wind turbines, up to 20 tons of cast iron are used per megawatt output. Thus, the development of more powerful wind turbines therefore leads to increasing challenges due to their heavy weight. Thus, new materials are considered for lightweight concepts and need to be characterized in detail. As an alternative to classical micromechanical model generation generative adversarial networks shall be used for microstructure reconstruction.

Your Tasks

- implementation of a GAN in existing in-house framework
- characterization of micrographs and training of the GAN using these
- comparison of artificial and real microstructures in terms of mechanical behaviour and morphology

Requirements

- ability to work autonomously
- interest in simulation and numerical modelling
- python knowledge required

Why should you apply?

We offer you a comprehensive introduction to the field of micromechanics. Thus, you’ll quickly become a part of the great team developing and validating new microstructural modelling approaches at IWM. Additionally, you’ll be supported to finish your thesis in a timely manner.

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