

Master thesis

Potential of Neural Networks for 3D-Point-Cloud-based One-Shot-Predictions of Aero-Solutions (m/f/d)

The design of aircraft engine turbines and compressors is a long period optimization task which requires many iterations of time consuming CFD (Computational Flow Field) simulations until the resulting aero solutions reach the desired quality standards. In order to speed up those iterations the potential of Graph Neural Networks (GNNs) and Point Cloud Networks will be evaluated. The objective is to create a concept and to develop and test a prototype for enhanced point-cloud or graph-based one-shot predictions of 3D-Aero-solutions.

YOUR TASKS

- Getting acquainted with the problem domain of aero solutions and CFD simulations. Analyzing and becoming familiar with the existing environment and provided CFD data.
- Studying the literature and identifying the most promising procedures to accelerate CFD simulations of internal aerodynamics of aircraft turbines by the capabilities of Deep Learning methods
- Implementing these procedures and checking the performance and accuracy
- Performing tests on various turbine geometries

YOUR PROFILE

- Major in computer science, mathematics or physics
- Programming experience in Python or related languages
- First experience and familiarity with Graph Neural Networks (GNNs) or Point Cloud Networks would be a plus
- Familiar with PyTorch, PyTorch Geometric, Pandas, Numpy, etc.
- Practical experience with Deep Learning (CNN, RNN, etc.)
- Willing to get familiar with existing code
- Duration: 6 months

OUR OFFER

- Insights into practical work in aviation as an innovative, high-tech industry
- Exciting jobs that carry responsibility and are performed in an atmosphere of team spirit
- A personally assigned contact from company and university side
- Flexible working hours and possibility to work remotely in the home office
- Networking opportunities

READY?

Give your career a boost and send us your complete application (CV, Transcript of Records) with subject "thesis application MTU" to amu@informatik.uni-kiel.de.
We look forward to getting to know you.