

Master thesis

Evaluation of Periodic Activation Functions and Fourier Features for Image-based Prediction of Aero-Solutions with Neural Networks (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 and to reach a comparable high-fidelity aero solution the potential of periodic activation functions, random Fourier features and tailored network architectures will be evaluated for the Prediction of 2D-, 3D- and 4D(video)-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
- Practical experience with Deep Learning (CNN, RNN, MLP, etc.)
- Advanced knowledge in Deep Neural Network Architectures would be a plus
- Familiar with PyTorch, Pandas, Numpy, 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.