



## Job advertisement for a master's thesis:

### Automated Aerodynamic Data Generation for Machine Learning

Within the project the candidate will collect CFD data and test Deep learning methods for estimation of 3D objects aerodynamic properties. The project aims to develop a numerically efficient method that could help in fast interactions of aerodynamic design. The project consists of the following steps:

1. Identify a part of a generic road vehicle that can be used to develop and test novel aerodynamic geometric Deep learning methods. The part should have a high variation in shape (i.e. side mirror, rear wing).
2. Automatically simulate around 100-500 geometries of the same part but with slightly different shapes using CFD. Generate results such as velocity fields, pressure fields and several aerodynamic coefficients such as drag coefficient and lift coefficient.
3. Apply Deep Learning methods for aerodynamic properties prediction.

The general conditions are discussed in a personal interview.

#### Required prior knowledge:

- OpenFOAM
- Good programming skills, preferably in Python
- Familiarity with statistical analysis and machine learning
- Understanding of computer vision concepts and convolutional neural networks

#### Desirable prior knowledge:

- Experience in automotive aerodynamics
- Basic knowledge and interest in geometric deep learning
- Experience with deep learning frameworks such as TensorFlow or PyTorch

#### Supervision:

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