



Dream big. With us.
Grow your career.

Master's Thesis „Machine Learning Models for Data Preparation in Automotive CFD-Simulation Process“

What we offer:

At Magna, you can expect an engaging and dynamic environment where you can help to develop industry-leading automotive technologies. We invest in our employees, providing them with the support and resources they need to succeed. As a member of our global team, you can expect exciting, varied responsibilities as well as a wide range of development prospects. Because we believe that your career path should be as unique as you are.

Group Summary:

As an engineering and manufacturing partner, Magna's Complete Vehicle group helps traditional OEMs and new entrants to bring their automotive visions to life. At Magna, you will work in an innovative, international and dynamic team, always pursuing the goal of delivering high-quality products. We work in a diverse environment with global development opportunities. Together with our employees we constantly strive to create a better world of mobility.

Job Responsibilities:

Location: Graz / asap / duration 6 months

Are you currently pursuing a master's degree with a technical focus and looking for a partner company to write your thesis?

Perfect! Magna Steyr is currently seeking a master's student to join us in the area of Computational Fluid Dynamics (CFD) and machine learning (ML).

The aim of this master thesis is to speed up the data preparation process for complete vehicle CFD-simulation. Data preparation is the bottleneck in current industrial CFD processes. Preparing a complete vehicle geometry for external or internal flow investigation keeps an engineer busy for several days. To speed up data preparation, a machine learning model should be developed to automate some portions of this process (mesh cleaning, part classification...). You will work together with CFD engineers as well as our machine learning experts and project engineers.

The following scopes should be included in your master thesis:

1. Conduct a literature review of previous works and define a schematic procedure.
2. Prepare a training database in ANSA. Either from historical or public data.
3. Research of various neural network architectures which can be considered for this application (e.g., 3D point- and mesh-based models).
4. Create a first model and train it with previously created dataset. Optimize model setup if necessary.
5. Create documentation and propose additional work to speed-up data preparation.

Who we are looking for:

- Ongoing technical study at the university / university of applied sciences in mechanical engineering, automotive engineering, computer science or similar.
- A good understanding of Python coding and machine learning libraries (e.g., PyTorch, NumPy, TensorFlow) is essential.
- Basic knowledge & experience in the field of numerics and CFD are beneficial but not mandatory.
- Basics in Beta CAE Systems software package ANSA is advantageous but not necessary.

Your preferred qualifications:

- Strong interest in bringing state-of-the-art machine learning to real world industry applications.
- High level of helpfulness and excellent communication skills.

Site Benefits:

- **Mobility offers and parking spaces** - Arriving at work is easy!
- **Everyday employee benefits, sport events, hiking and many other activities** – Exclusively for you!
- **Canteen, our café and shops** – Our catering offers for you!
- **Holistic health programs and multiple on-site consulting services** - Magna supports!
- **Sustainability Programs** - Work and live responsibly!

Your profile matters!

You will receive a monthly gross compensation of €700 for writing your master's thesis. Depending on your education and specific professional experience, there is a corresponding willingness to overpay.

And now: It's your turn!

We are looking forward to receiving your application.

Please include your CV. As we are excited to learn more about you, please also submit a covering letter.

If you have any questions, please don't hesitate to contact us

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Recruiting/Talent Attraction

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Group Leader Structural Design

Institute of Automotive Engineering

Awareness, Unity, Empowerment:

At Magna, we believe that a diverse workforce is critical to our success. That's why we are proud to be an equal opportunity employer. We hire on the basis of experience and qualifications, and in consideration of job requirements, regardless of, in particular, color, ancestry, religion, gender, origin, sexual orientation, age, citizenship, marital status, disability or gender identity. Magna takes the privacy of your personal information seriously. We discourage you from sending applications via email to comply with GDPR requirements and your local Data Privacy Law.