

Marius Neuhalfen

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Mechanical Engineering student
passionate about Computer Vision,
AI Safety and Alignment.

WORK EXPERIENCE

Blackswan Space

March - September 2025 (ongoing)

Internship, Reference: Marius Klimavicius, CEO, marius@blackswanspace.com

Vilnius, Lithuania

- Developing robust pose estimation machine learning models for in-orbit-servicing. Using analytical methods to generate physics-informed datasets, including adverse pose selection and automatic landmark generation.

European Space Agency, ESTEC

July – December 2024

Internship, Reference: Jonathan Grzymisch, jonathan.grzymisch@esa.int

Noordwijk, The Netherlands

- Developed a novel view synthesis-based method for validating vision-based navigation systems. Demonstrated that inference on synthesized views achieves $<1\%$ pose error relative to inter-satellite distance, even with datasets $3-8\times$ less dense than current benchmarks—thus enabling real-time validation of image processing.
- Developed a new mathematical measure of pose difficulty (Boresight Deviation Distance) that characterises more accurately than existing measures the semantic differences in images captured from different viewpoints.

Laboratoire de Mécanique des Fluides "Kampé de Fériet"

January 2023 – February 2023

Internship

Lille, France

- Performed CFD simulations with Star-CCM++ on novel wind turbine blade designs. Used a wind tunnel to characterize the stall angle, lift performance and pressure profile of the blades, achieving optimized efficiency.

EDUCATION

École Centrale de Lille

2022 - 2024

Diplôme d'Ingénieur, General Engineering

Lille, France

- Double Degree in General Engineering to obtain the "Diplôme d'Ingénieur" equivalent to a Master's degree.
- Relevant Modules: Fluid Mechanics, Estimation Theory, Control Theory, Manufacturing and Machining, FEM.
- Successfully completed various group projects including development of an AI for facial recognition, design of a radial piston pump and construction of cold gas thrusters for rocket attitude control (for details see portfolio).

RWTH Aachen

2020 - 2025 (expected, ongoing)

Bachelor of Science, Mechanical Engineering

Aachen, Germany

- Relevant modules: Mechanics & Dynamics of Rigid Bodies, Mathematics, Fluid Mechanics, Thermodynamics.
- Heavily involved in the aerospace association "Space Team Aachen" for the development of a nanosatellite.

POSITIONS OF RESPONSIBILITY

- **Young ESA Entrepreneurship Group Event coordinator:** Organization of internal Masterclasses inviting accomplished start-up founders from European Aerospace. Inspiring aerospace graduates for entrepreneurship.
- **Team lead of PERSEUS Avionique IV:** Led a 5-member team over 1 ½ years. Together we developed the pneumatic attitude control of the rocket. Negotiated the product specification with our client, CNES, facilitated internal communication and managed the development schedule for this project with a budget of over 4000€.
- **Délégué de promotion:** Representing international students and their concerns to the school administration.

LANGUAGES, SOFTWARE SKILLS & INTERESTS

- **Languages:** German (native language), French (DALF C1), English (C2, TOEIC 990/990), Spanish (beginner).
- **Software Skills:** Advanced: MATLAB, Simulink, Python, CAD, Git, Machine Learning (PyTorch, ONNX). Intermediate: C/C++, LaTeX, FEM (Catia). Basic: CFD (Star-CCM+), Circuit Design (KiCad).
- **Interests:** Entrepreneurship and Founding, Improvisational theater (performing several times a year), Piano