# Johannes Autenrieb

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## Education

**Technical University of Braunschweig** **Braunschweig, DE**
*Ph.D. Candidate* *since 03/2022*
- Dissertation Title: A Nonlinear Attitude Control Approach for a Class of Overactuated and Highly Uncertain Hypersonic Flight Systems.

**University of Oxford** **Oxford, UK**
*Visiting Ph.D. Student* *since 08/2024*
- Research on online optimization algorithms for improved decision-making in nonlinear system networks under uncertain dynamic conditions.

**Massachusetts Institute of Technology (MIT)** **Cambridge, USA**
*Visiting Ph.D. Student* *08/2022 – 02/2023*
- Research on control barrier functions for use in safety-critical, nonlinear, and adaptive flight control systems.

**Cranfield University** **Cranfield, UK**
*M.Sc. in Autonomous Vehicle Dynamics & Control* *09/2018 – 10/2019*
- Master's Thesis: Development of a neural network-supported nonlinear flight control system for an air taxi with a tilt-wing concept.

**Anyang University** **Seoul, KOR**
*M.Sc. Exchange Semester* *02/2018 – 06/2019*
- Courses: Cross-Cultural Communication, Leadership Discovery, Korean Language.

**University of Applied Sciences Aachen** **Aachen, DE**
*B.Eng. in Aerospace Engineering* *09/2012 – 03/2017*
- Bachelor's Thesis: Development of a generic parameterized 6DOF flight dynamics model for a flight simulator to improve Eurofighter pilot training.

## Work Experience

**German Aerospace Center (DLR)** **Braunschweig, DE**
*Research Associate* *since 12/2019*
- Research in the field of nonlinear Guidance & Control and advising industrial/political institutions regarding the implications of hypersonic missile technologies.

**Rolls-Royce** **Cranfield, UK**
*Master's Thesis Candidate* *04/2019 – 09/2019*
- Development of flight control algorithms (nonlinear dynamic inversion, adaptive neural networks, control allocation) for novel eVTOL concepts.

**Korea Advanced Institute of Science and Technology (KAIST)** **Daejeon, KOR**
*Visiting Research Student* *04/2018 – 06/2018*
- Programming and modeling of a simulation framework for the generic simulation of nonlinear flight dynamics of novel aircraft.

**CAE GmbH** **Stolberg, DE**
*Bachelor's Thesis Candidate, Intern, and Working Student* *03/2015 – 02/2018*
- Collaborated in a multinational Scrum team to develop and integrate new features, tools, and tests for the Eurofighter flight simulation.

## Professional Committees and Commissions

**European Defence Agency (EDA)** **Brussels, BE**
*Non-Governmental Expert* *since 01/2021*
- Supporting research and development activities of the European Union in the field of Guidance, navigation, and control technologies for military aerospace systems.

**NATO STO** **Brussels, BE**
*Research Group Member* *since 12/2020*
- Analysis of the impact of hypersonic threats on military operations and technical requirements for defense systems.

## Awards and Honors

**09/2022**: Travel grant for talented young researchers at German Aerospace Center (DLR).

**10/2019**: "Course Director's Prize" for outstanding overall performance at Cranfield University.

**03/2019**: Group-Award for Best UAV Design at BAE UAV Swarm Challenge.

**09/2018**: Scholarship for studies at Cranfield University.

**02/2018**: Magellan Network Scholarship for an exchange semester at Anyang University.

## Academic Services and Voluntary Work

**Paper Reviewer**
*Journals and Conferences* *since 10/2019*
- ACC 2025, IEEE Control Systems Letters, CEAS EuroGNC 2024, ASCE Journal of Aerospace Engineering, CEAS EuroGNC 2022, IEEE REDUAS 2019

**Germany Foundation Integration** **Berlin, DE**
*Mentor* *since 09/2023*
- Mentoring high-achieving students with migration backgrounds to support them in their early academic careers.

**Unmanned & Intelligent Systems Society, Cranfield University** **Cranfield, UK**
*President* *09/2018 – 10/2019*
- Managed the organization with over 60 doctoral and master's students, including project coordination and administration of society activities.

**Cranfield University** **Cranfield, UK**
*Course Representative* *09/2018 – 10/2019*
- Represented the interests of students in the Master's program in Autonomous Vehicle Dynamics & Control in meetings with faculty and staff.

**University Sports Center, RWTH Aachen** **Aachen, DE**
*Instructor/Boxing Trainer* *03/2015 – 02/2018*
- Conducted weekly boxing classes for students (class size: approx. 30 participants) and successfully participated in several national championships as a coach.

## Teaching

**Technical University of Braunschweig** **Braunschweig, DE**
*Teaching Assistant* *10/2024 – 02/2025*
- Supporting weekly tutorials in "Modern Control Systems" for up to ca. 40 Aerospace Engineering graduate students.

**Technical University of Braunschweig** **Braunschweig, DE**
*Teaching Assistant* *02/2024 – 06/2024*
- Collaboratively Planning and conducting weekly tutorials in "Systemics (Basics of Systems Science)" for up to ca. 40 Aerospace Engineering graduate students.

**University of Applied Sciences Aachen** **Aachen, DE**
*Teaching Assistant* *09/2014 – 02/2015*
- Planning and conducting weekly tutorials in "Technical Mechanics 3 (Dynamics)" for up to ca. 30 Aerospace and Automotive Engineering undergraduate students.

## Publications

**Journal Papers**

1. J. Autenrieb, P. Fisher, and A. Annaswamy, *Safe and stable adaptive control via control barrier functions (in progress)*, IEEE Transactions on Control Systems Technology
2. J. Autenrieb and H.-S. Shin, *Complementary filter-based hybrid incremental nonlinear model following control design for a tilt-wing uav (under review)*, International Journal of Robust and Nonlinear Control
3. J. Autenrieb and N. Fezans, *Flight control design for a hypersonic waverider configuration: A non-linear model following control approach*, CEAS Space Journal, (2024), pp. 1–24

**Conference Papers**

1. J. Autenrieb and H.-S. Shin, *Sensor-based safety-critical control using an incremental control barrier function formulation via reduced-order approximate models (submitted)*, in American Control Conference (ACC) 2025, jul 2025
2. J. Autenrieb and P. Gruhn, *An iterative dynamic control allocation formulation for hypersonic vehicles with asymmetrical input limitations on magnitude and rate (accepted)*, in AIAA SCITECH 2025 Forum, jan 2025
3. J. Autenrieb, N. Fezans, and P. Gruhn, *Leveraging quasi-lpv dynamic models for gain scheduling cascaded ndi-based midcourse attitude controllers of hypersonic glide vehicles (accepted)*, in AIAA SCITECH 2025 Forum, jan 2025
4. J. Autenrieb and A. Annaswamy, *Safe and stable adaptive control for a class of dynamic systems*, in 2023 62nd IEEE Conference on Decision and Control (CDC), dec 2023, pp. 5059–5066
5. J. Autenrieb, *Data fusion-based incremental nonlinear model following control design for a hypersonic waverider configuration*, in AIAA SCITECH 2023 Forum, jan 2023
6. D. Kiehn, J. Autenrieb, and N. Fezans, *Coast - a simulation and control framework to support multidisciplinary optimization and aircraft design with cpacs*, sep 2022
7. J. Autenrieb, N. Fezans, P. Gruhn, and J. Klevanski, *Towards a Control-Centric Modelling and Simulation-Framework for Hypersonic Glide Vehicles*, in German Aeronautics and Space Congress (DLRK), Bremen, Germany, sep 2021
8. J. Autenrieb and N. Fezans, *Nonlinear model following control design for a hypersonic waverider configuration*, in Proceedings of the 2022 CEAS EuroGNC conference, Berlin, Germany, may 2022
9. J. Autenrieb, N. Strawa, H.-S. Shin, and J.-H. Hong, *A mission planning and task allocation framework for multi-uav swarm coordination*, in 2019 Workshop on Research, Education and

Development of Unmanned Aerial Systems (RED UAS), vol. nov, dec 2019, pp. 297–304
10. J. Autenrieb, H.-S. Shin, and M. Bacic, *Development of a neural network-based adaptive nonlinear dynamic inversion controller for a tilt-wing vtol aircraft*, in 2019 Workshop on Research, Education and Development of Unmanned Aerial Systems (RED UAS), nov 2019, pp. 44–52