

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

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)

Non-Governmental Expert

Brussels, BE

since 01/2021

- Supporting research and development activities of the European Union in the field of leadership, navigation, and control technologies for military aerospace systems.

NATO STO

Research Group Member

Brussels, BE

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 the exchange semester at Anyang University.

Academic Services and Voluntary Work

Paper Reviewer

Journals and Conferences

since 10/2019

- IEEE REDUAS 2019, CEAS EuroGNC 2022 2024, IEEE Control Systems Letters, ASCE Journal of Aerospace Engineering, CEAS EuroGNC 2024

Germany Foundation Integration

Mentor

Berlin, DE

since 09/2023

- Mentoring high-achieving students with migration backgrounds to support them in their early academic careers.

Unmanned & Intelligent Systems Society, Cranfield University

President

Cranfield, UK

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

Course Representative

Cranfield, UK

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

Instructor/Boxing Trainer

Aachen, DE

03/2015 – 02/2018

- Conducted weekly boxing classes for students (class size: approx. 40 participants) and successfully participated in several national championships as a coach.

Teaching

Technical University of Braunschweig

Braunschweig, DE

Teaching Assistant

10/2024 – 02/2025

- Planning and conducting weekly tutorials in "Modern Control Systems" for up to ca. 60 Aerospace Engineering graduate students.

Technical University of Braunschweig

Braunschweig, DE

Teaching Assistant

02/2024 – 06/2024

- Planning and conducting weekly tutorials in "Systemics (Basics of Systems Science)" for up to ca. 90 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, *Sensor-based safety-critical control: An incremental control barrier function formulation (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 (in progress)*, in American Control Conference (ACC) 2025, 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