

Dr. Nikolaus Vertovec

POSTDOCTORAL RESEARCHER · DEPARTMENT OF COMPUTER SCIENCE

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Born: June 9th, 1997 | **Nationality:** British, German, American | **Marital Status:** Civil Partnership

Education

University of Oxford

DPhil ENGINEERING SCIENCE

Oxford, United Kingdom

2020 - 2024

- Supervisors: Prof. Kostas Margellos & Prof. Sina Ober-Blöbaum
Thesis: Optimal Control for Safety-Critical Systems

ETH Zurich

BACHELOR OF SCIENCE ETH IN ELECTRICAL ENGINEERING AND INFORMATION TECHNOLOGY

Zurich, Switzerland

2016 - 2019

Georg Christoph Lichtenberg Gesamtschule

ABITUR 1.0 (HIGHEST GRADE IN COHORT)

Göttingen, Germany

2007 - 2016

Professional Experience

2024 - present	Postdoctoral Researcher	Dept. of Computer Science, University of Oxford
2020 - 2024	Doctoral Researcher	Dept. of Engineering Science, University of Oxford
2019 - 2020	Intern (Robot Operations - Mars Perseverance Rover)	NASA Jet Propulsion Laboratory, Pasadena
2018 - 2019	Control Engineer	Swiss Academic Spaceflight Initiative, Zurich
2016 - 2016	Intern (computer vision/indoor drone navigation)	Debuggable Limited, Berlin
2015 - 2016	Research Assistant - Software Engineering	Institute for Computer Science, University of Göttingen

Grants and Fellowships

- 2023–2026 **Career Development Fellowship in Artificial Intelligence (£250,000)**, St Hugh's College, University of Oxford — 3-year research fellowship supporting independent research (2023–2026)
- 2024–2025 **Fellows' Discretionary Research Fund**, St Hugh's College, University of Oxford — Competitive internal funding supporting research
- 2021–2022 **Graduate Study Support Fund**, Keble College, University of Oxford — Competitive internal funding for graduate student research

Publications

- N. Vertovec, F. B. Mathiesen, T. Badings, L. Laurenti, A. Abate (2025). Scalable Verification of Neural Control Barrier Functions Using Linear Bound Propagation. Learning for Dynamics & Control Conference 2026 (under review)
- F. B. Mathiesen*, N. Vertovec*, F. Fabiano, L. Laurenti, A. Abate (2025). Certified Neural Approximations of Nonlinear Dynamics. International Conference on Learning Representations 2026 (under review)
- P. Solanki*, N. Vertovec*, Y. Schnitzer, J. Van Beers, C. de Visser, A. Abate (2025). Certified Approximate Reachability (CARE): Formal Error Bounds on Deep Learning of Reachable Sets. 2025 IEEE 64th Conference on Decision and Control (CDC), Rio de Janeiro, Brazil, 2025 (accepted)
- N. Vertovec, K. Margellos, M. Prandini (2025). Finite sample learning of moving targets. In Automatica (accepted, in print)

- J. Cloete, N. Vertovec, A. Abate (2025). SPoRt - Safe Policy Ratio: Certified Training and Deployment of Task Policies in Model-Free RL. Proceedings of the Thirty-Fourth International Joint Conference on Artificial Intelligence, 4976–4984
- T. Heil, F. Meissner, N. Vertovec (2025). Techno-material entanglements and the social organisation of difference. In Ethnic and Racial Studies, vol. 48, no 9. pp. 1859–1875.
- N. Vertovec (2024). Optimal control for safety-critical systems. PhD Thesis
- N. Vertovec, S. Ober-Blöbaum, K. Margellos (2024). Safety-Aware Hybrid Control of Airborne Wind Energy Systems. In Journal of Guidance, Control, and Dynamics, vol. 47, no. 2, pp. 326–338.
- N. Vertovec, K. Margellos (2023). State Aggregation for Distributed Value Iteration in Dynamic Programming. In IEEE Control Systems Letters, vol. 7, pp. 2269–2274.
- N. Vertovec, K. Margellos (2022). Multi-objective low-thrust spacecraft trajectory design using reachability analysis. In European Journal of Control, vol. 69, p. 100758.
- N. Vertovec, Sina Ober-Blöbaum, K. Margellos (2022). Verification of safety critical control policies using kernel methods. In 2022 European Control Conference (ECC), London, United Kingdom, pp. 1870-1875.
- N. Vertovec, S. Ober-Blöbaum, K. Margellos (2021). Multi-objective minimum time optimal control for low-thrust trajectory design. In 2021 European Control Conference (ECC), Delft, Netherlands, pp. 1975-1980.

Teaching Experience

Dept. of Computer Science, University of Oxford

2024-present	Continuous Maths
2024	Modern Control Systems

Dept. of Mathematics, ETH Zurich

2019	Numerical Methods
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Dept. of Electrical Engineering, ETH Zurich

2018	Digital Circuits Lab
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Dept. of Engineering Science, University of Oxford

2024-present	Engineering in Society
2022-2025	Introduction to Control Theory
2022-2024	Introduction to Computing
2022-2023	Control Lab
2022-2023	Linear and Optimal Control

Peer Review

CONFERENCES REVIEWS:

International Symposium on AI Verification (SAIV)
 Conference on Decision and Control (CDC)
 American Control Conference (ACC)
 Learning for Dynamics & Control Conference (L4DC)
 Airborne Wind Energy Conference (AWEC)
 European Control Conference (ECC)

JOURNAL REVIEWER

Automatica
 IEEE Transactions on Control Systems Technology (TCST)
 IEEE Transactions on Cybernetics
 IEEE Control Systems Letters (L-CSS)
 European Journal of Operational Research
 Wind Energy Science

COMMITTEE ROLES AND SESSION ORGANIZER:

Conference on Hybrid Systems: Computation and Control (HSCC), poster committee
 Conference on Decision and Control (CDC), Invited Session organizer on "Safe planning and control with uncertainty quantification"