# RUDOLF REITER

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github.com/RudolfReiter

Passionately committed to shaping the future of robotics through innovative solutions. Eager to tackle new challenges, embrace responsibility, and develop software at the highest standards.

## SKILLS

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|---|---|
| Languages | German (native), English (business fluent) |
| Programming languages | C/C++ (3 years), Python (5 years), MATLAB (6 years) |
| Optimization software | CasADi, acados, ForcesPro, Yalmip, Gurobi, CVXPY, MOSEK |
| Machine learning libraries | PyTorch, TensorFlow, Stable Baselines 3, RLLIB, OpenCV |
| Platforms and operating systems | ROS 1+2, NVIDIA Drive PX2, Speedgoat, Linux |

## EDUCATION

**Ph.D. Candidate** | ***Systems Control and Optimization Laboratory*** — Mar. 2020 ∼ Nov. 2024
University of Freiburg, Prof. Dr. Moritz Diehl — Freiburg, Germany
*Topic: Optimization-Based Motion Planning for Autonomous Driving*

- Marie Skłodowska-Curie Innovative Training Network Fellow: "ELO-X: Embedded learning and optimization for the next generation."
- 45 ECTs coursework in machine learning

**Research Visit** | ***Institute for Dynamic Systems and Control*** — Jan. – May 2024
ETH Zürich, Prof. Dr. Melanie Zeilinger — Zürich, Switzerland

**Research Visits** | ***Department of Control Systems*** — Apr. 2022, Sep. 2023
IMT School of Advanced Studies, Prof. Dr. Alberto Bemporad — Lucca, Italy

**Master of Science** | ***Electrical Engineering: Control Systems and Mechatronics*** — Oct. 2013 – Jan. 2016
Technical University of Graz / University of Utah | GPA: 1.2 (*passed with honors*) — Graz, Austria,
*Master's Thesis: Modeling of Nonlinear Drive-Train Dynamics* — Salt Lake City, UT, USA

**Bachelor of Science** | ***Electrical Engineering: Control Systems and Mechatronics*** — Oct. 2009 – June 2012
Technical University of Graz | GPA: 1.5 (*passed with honors*) — Graz, Austria

**Community Service** — Aug. 2008 – May 2009
Paramedic at the Red Cross — Salzburg, Austria

**Secondary Technical College** | ***Electronic Engineering and Information Systems*** — Sep. 2003 – Jun. 2008
*Diploma Project: High-Resolution USB Measurement System - Hardware and Software* — Salzburg, Austria

## WORK EXPERIENCE

**Software Developer, C++** — Dec. 2019 ∼ Aug. 2024
Autonomous Racing Graz — Graz, Austria

- Development of embedded algorithms for real-world autonomous racing
- Focus on prediction, planning, and control algorithms

**Machine Learning for Robotic Motion Planning Intern** — Jan. 2023 – May 2023
Mitsubishi Electric Research Laboratories — Cambridge, MA, USA

**Combinatorial Optimization for Autonomous Driving Intern** — Apr. 2022 – May 2022
ODYS S.r.l. — Milano, Italy

**Software Developer, Python/C++, Researcher** — Dec. 2018 – Jul. 2021
Virtual Vehicle Research Center — Graz, Austria

- Algorithms for path planning and control of autonomous vehicles
- Developing simulation frameworks for autonomous driving

**Control Systems Specialist, MATLAB/C++/C/Python** Jul. 2016 – Jul. 2018
Anton Paar GmbH Graz, Austria

- Development of advanced control systems for high-end measurement devices
- Worldwide first full automation of an atmospheric distillation analyzer
- Viscosity measurement: among primary authors of US patent *US 10,976,230 B2*

**Master's Thesis Internship, Drivetrain** Apr. 2015 – Dez. 2015
Virtual Vehicle Research Center Graz, Austria

**Control Systems Engineering Internship, MATLAB/C++** Sep. 2012 – Dez. 2012
Bernecker & Rainer Industrial Automation GmbH Salzburg, Austria

- Development of an H-infinity control for electric drives

**Software Engineering Internship, low-level CNC** Jul. 2010 – Aug. 2010
Bernecker & Rainer Industrial Automation GmbH Salzburg, Austria

**Software Engineering Internship, C++** Apr. 2009 – Jul. 2009
Step4 GmbH Salzburg, Austria

**Robotic Hardware Engineering Internship** Jul. 2006 – Aug. 2006
Sony DADC Austria AG Salzburg, Austria

## Selected Publications

**Equivariant Deep Learning of Mixed-Integer Optimal Control Solutions for Vehicle Decision Making and Motion Planning** May 2024
IEEE Transactions on Control Systems Technology, ISSN: 1558-0865
Reiter R., Quirynen R., Diehl M., Di Cairano S.

**A Long-Short-Term Mixed-Integer Formulation for Highway Lane-Change Planning** May 2024
IEEE Transactions on Intelligent Vehicles, ISSN: 2379-8858
Reiter R., Nurkanović A., Bernardini D., Diehl M., Bemporad A.

**A Hierarchical Approach for Strategic Motion Planning in Autonomous Racing** June 2023
European Control Conference 2023, pp. 1-8 / 41st ICML, Poster 2024
Reiter R., Hoffmann J., Boedecker J., Diehl M.

**Frenet-Cartesian Model Representations for Automotive Obstacle Avoidance within Nonlinear MPC** June 2023
European Journal of Control, ISSN: 0947-3580
Reiter R., Nurkanović A., Frey J., Diehl M.

## Private

Besides my technical interests, I enjoy being outdoors. I am passionate about climbing, hiking, listening to Jazz music, and reading.

Freiburg, September 18, 2024