RUDOLF REITER

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I am passionately committed to shaping the future through innovative solutions and advancing the fields of optimization, artificial intelligence, and control. Moreover, I am motivated to tackle new challenges and eager to embrace responsibility.

EDUCATION

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

- Marie Skłodowska-Curie Innovative Training Network Fellow: "*ELO-X*: Embedded learning and optimization for the next generation."
- Research stays at IMT Lucca (Italy), ODYS S.r.l. (Milano, Italy), MERL (Cambridge, USA), ETH Zürich (Switzerland)
- 50 ECTs course work in machine learning

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 honours*) — Graz, Austria
Master's Thesis: Modeling of Specific Nonlinear Drive-Train Dynamics

Bachelor of Science | ***Electrical Engineering: Control Systems and Mechatronics*** — Oct. 2009 – June 2012
Technical University of Graz | GPA: 1.5 (*passed with honours*) — Graz, Austria
Bachelor's Thesis: Modeling of Complex Magnetic Fields utilizing the Finite Elements Method

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 — Dec. 2019 ∼ Aug. 2024
Autonomous Racing Graz, *ARG* — Graz, Austria

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

Robotics Motion Planning Intern — Jan. 2023 – May 2023
Mitsubishi Electric Research Laboratories, *MERL* — Cambridge (MA), USA

- Research on learning-based mixed-integer optimization for motion planning

Software Developer, 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 — Jul. 2016 – July 2018
Anton Paar GmbH — Graz, Austria

- Development of high-end control systems for mass production
- Worldwide first full automation of an atmospheric distillation analyzer
- Viscosity measurement: main author of US patent *US 10,976,230 B2*

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

Control Systems Engineering Internship Sep. 2012 – Dez. 2012
Bernecker&Rainer Industrial Automation GmbH Salzburg, Austria

- Development of an "H-infinity" control for electric drives

Software Engineering Internship Jul. 2010 – Aug. 2010
Bernecker&Rainer Industrial Automation GmbH Salzburg, Austria

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

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

Exemplary Publications

Equivariant Deep Learning of Mixed-Integer Optimal Control Solutions for Vehicle Decision Making and Motion Planning June 2024
IEEE Transactions on Control System Technology
Reiter R., Quirynen R., Diehl M., Di Cairano S.

A Long-Short-Term Mixed-Integer Formulation for Highway Lane-Change Planning June 2024
IEEE Transactions on Intelligent Vehicles
Reiter R., Nurkanovic A., Bernardini D., Diehl M., Bemporad A.

A Hierarchical Approach for Strategic Motion Planning in Autonomous Racing June 2023
European Control Conference, Int. Conf. on Machine Learning, 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 2023
Reiter R., Nurkanovic A., Frey J., Diehl M.

Skills

Languages	German (Native), English (fluent)
Programming Languages	Python, C, C++, MATLAB
Optimization Libraries	CasADi, Acados, Yalmip, Gurobi, CVXPY, MOSEK
Machine Learning Libraries	PyTorch, TensorFlow, Stable Baselines 3, RLLIB, OpenCV
Platforms and OS	Windows, Linux, ROS1, ROS2, NVIDIA Drive PX2, Speedgoat

Private

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

Freiburg, August 14, 2024