Lasse Peters

curriculum vitae

Education

2017-2020 **M.Sc. Mechatronics**, *TUHH*, Hamburg.
Specialization: Intelligent Systems and Robotics.

2018-2019 **UC Berkeley Extension**, *University of California*, Berkeley.
Visiting Student. Topics: model predictive control, control of unmanned areal vehicles, introduction to artificial intelligence, sensor fusion in autonomous driving.

2014–2017 **B.Sc. Mechanical Engineering**, *TUHH*, Hamburg.
Specialization: Theoretical Mechanical Engineering.

2006–2013 **General Qualification for University Entrance (Abitur)**, *Gymnasium Neu Wulmstorf*.
Advanced Courses: Mathematics, Physics, Chemistry.

Experience

Research

2019 **Hybrid Systems Laboratory**, *University of California*, Berkeley.
Research into safe and efficient robotic interaction.

Game-Theoretic Planning Development of planning techniques to deal with the presence of multiple equilibria and uncertain objectives of other players in differential games [1, 2, 3, 4].

POMDP Planning Comparison of POMDP approximations for safe and efficient robotic interaction under behavioral uncertainty [5].

Engineering

2014-2019 **RoboCup SPL**, *RobotING@TUHH e.V.*, Hamburg.
Project of voluntary students concerned with development of a full software pipeline in C++ (perception, state estimation, behavior planning, control) for autonomous humanoid soccer robots. Role: team lead motion and control 2016, head of development 2017-2018, member of the board 2017-2019. Participant at RoboCup world championship: Leipzig (Germany, 2016), Nagoya (Japan, 2017), Montreal (Canada, 2018), and Sydney (Australia, 2019).

Meta-Learning Employing meta-learning strategies to find efficient CNN topologies for real time object detection [6].

Collaborative State Estimation Tracking and state estimation of objects using local state estimates of multiple agents.

Robot Self-Localization Vision based self-localization using a multi-hypothesis unscented Kalman filter [7].

Bipedal Walking and Kicking A bipedal gait for robot soccer on the NAO platform, featuring dynamic execution of in-walk-kicks.

Fall Protection Detection of disruptive, unrecoverable external disturbances during bipedal walking. Implementation of an emergency controller for hardware protection.

2018 **Berkeley Deep Drive**, *Model Predictive Control Laboratory, University of California*, Berkeley.
Implementation of a sensor fusion module for odometry estimation on an autonomous research vehicle. Used for ground truth in data collection for a *Berkeley Deep Drive* project.

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Teaching

2016–2018 **Teaching Assistant: Thermodynamics**, *Institute of Engineering Thermodynamics, TUHH*, Hamburg.
Tutoring at group exercises accompanying the lectures of Thermodynamics.

2015–2016 **Teaching Assistant**, *dual@TUHH*, Hamburg.
Organization of robotics courses at high schools in the greater Hamburg area. Training of robotics tutors.

2015 **Teaching Assistant: Robotics Classes**, *dual@TUHH*, Hamburg.
Tutoring at robotics classes at high schools in the greater Hamburg area.

Awards and Scholarships

2018-2019 **DAAD ISAP Scholarship**.
Scholarship program for highly qualified students to complete a part of their degree program at a partner university (UC Berkeley).

2018 **Delmes-Buxmann-Award of the Rotary Club Hamburg-Haake**.
Award for the best mechanical engineering Bachelor's degree in 2017 at Hamburg University of Technology.

2017-2019 **Deutschlandstipendium**.
Scholarship program for high-achieving and committed students.

2017 **Team Award of the Dr. Friedrich Jungheinrich-Stiftung**.
Award for outstanding performance in the team project "Machine Design Methodology".

Skills

Languages	German (native), English (fluent)
Programming	C++, Julia, Python, Rust, Go, Java, JavaScript, Matlab
Other	Flux.jl (Julia deep learning framework), ROS, Keras/Tensorflow, git, Linux

Publications

[1] Lasse Peters. "Accommodating Intention Uncertainty in General-Sum Games for Human-Robot Interaction". Master's thesis. Hamburg University of Technology, 2020.

[2] Lasse Peters, David Fridovich-Keil, Claire J. Tomlin, and Zachary N. Sunberg. "Inference-Based Strategy Alignment for General-Sum Differential Games". In: *International Conference on Autonomous Agents and Multi-Agent Systems (AAMAS)*. 2020.

[3] David Fridovich-Keil, Ellis Ratner, Lasse Peters, Anca D. Dragan, and Claire J. Tomlin. "Efficient Iterative Linear-Quadratic Approximations for Nonlinear Multi-Player General-Sum Differential Games". In: *IEEE International Conference on Robotics and Automation (ICRA)*. 2020.

[4] Lasse Peters and Zachary N. Sunberg. "iLQGames.jl: Rapidly Designing and Solving Differential Games in Julia". In: *International Workshop on Engineering Multi-Agent Systems (EMAS)*. 2020.

[5] Lasse Peters. "Partially Observable Markov Decision Processes for Planning in Uncertain Environments". Project thesis. Hamburg University of Technology, 2019.

[6] Georg Christian Felbinger, Patrick Göttsch, Pascal Loth, Lasse Peters, and Felix Wege. "Designing Convolutional Neural Networks Using a Genetic Approach for Ball Detection". In: *RoboCup 2018: Robot World Cup XXII*. Springer International Publishing, 2018.

[7] Lasse Peters. "Adaption und Vergleich von Nichtlinearen Filtermethoden zur Selbstlokalisierung auf einem Feld mit dem Humanoiden NAO-Robotiksystem". English title: "Adaption and Comparison of Nonlinear Filtering Methods for Self-Localization using the Humanoid NAO Robot". Bachelor's thesis. Hamburg University of Technology, 2017.

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