Lasse Peters

curriculum vitae

Education

2021 - Present **Ph.D. Engineering**, *TU Delft*, Delft
Advisors: Javier Alonso-Mora and Laura Ferranti

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.

Publications

[1] Jingqi Li, Chih-Yuan Chiu, **Lasse Peters**, Fernando Palafox, Mustafa Karabag, Javier Alonso-Mora, Somayeh Sojoudi, Claire Tomlin, and David Fridovich-Keil. "Scenario-Game ADMM: A Parallelized Scenario-Based Solver for Stochastic Noncooperative Games". In: *Proc. of the IEEE Conference on Decision and Control (CDC)* (2023).

[2] **Lasse Peters**, Andrea Bajcsy, Chih-Yuan Chiu, David Fridovich-Keil, Forrest Laine, Laura Ferranti, and Javier Alonso-Mora. "Contingency Games for Multi-Agent Interaction". In: *arXiv preprint arXiv:2304.05483 (Under review at RA-L)* (2023).

[3] **Lasse Peters**, Vicenc Rubies-Royo, Claire J. Tomlin, Laura Ferranti, Javier Alonso-Mora, Cyrill Stachniss, and David Fridovich-Keil. "Online and Offline Learning of Player Objectives from Partial Observations in Dynamic Games". In: *Intl. Journal of Robotics Research (IJRR)*. 2023. URL: `https://journals.sagepub.com/doi/pdf/10.1177/02783649231182453`.

[4] **Lasse Peters***, Xinjie Liu*, and Javier Alonso-Mora. "Learning to Play Trajectory Games Against Opponents with Unknown Objectives". In: *IEEE Robotics and Automation Letters* (2023).

[5] **Lasse Peters**, David Fridovich-Keil, Laura Ferranti, Cyrill Stachniss, Javier Alonso-Mora, and Forrest Laine. "Learning Mixed Strategies in Trajectory Games". In: *Proc. of Robotics: Science and Systems (RSS)*. 2022. URL: `https://arxiv.org/abs/2205.00291`.

[6] **Lasse Peters**, David Fridovich-Keil, Vicenc Rubies-Royo, Claire J. Tomlin, and Cyrill Stachniss. "Inferring Objectives in Continuous Dynamic Games from Noise-Corrupted Partial State Observations". In: *Proc. of Robotics: Science and Systems (RSS)*. 2021. URL: `https://arxiv.org/abs/2106.03611`.

[7] 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: *Proc. of IEEE International Conference on Robotics and Automation (ICRA)*. 2020.

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

[9] **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.

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[10] **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.

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

[12] **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.

Honors & Awards

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".

Experience

Professional Activities

Review Committee

ICRA 2023 Workshop on Multi-Robot Learning

External Reviewer

RSS: Robotics: Science & Systems

L4DC: Learning for Dynamics and Control

ICRA: IEEE International Conference on Robotics and Automation

IROS: IEEE International Conference on Intelligent Robots and Systems

TAC: IEEE Transactions on Automatic Control

RA-L: IEEE Robotics and Automation Letters

L-CSS: IEEE Control Systems Letters

CDC: IEEE Conference on Decision and Control

Invited Talks and Guest Lectures

2023 **Invited Talk: Contingency Games**, *Nuro*
Invited talk on game-theoretic contingency planning. [recording]

2023 **Invited Talk: Contingency Games**, *Motional*
Invited talk on game-theoretic contingency planning.

2022 **Guest Lecture: Perspectives on Inverse Games**, *UT Austin*
Guest lecture giving an overview of methods for (online) inverse games in David Fridovich-Keil's class "Modeling Multi-Agent Systems".

2021 **Guest Lecture: Inference and Learning in Games**, *UT Austin*
Guest lecture on intent inference in dynamic games in David Fridovich-Keil's class "Modeling Multi-Agent Systems".

2021 **Guest Lecture: Model-Predictive Control**, *University of Bonn*
Two guest lectures on the fundamentals and basic numerics of model-predictive control in Cyrill Stachniss' class "Techniques for Self-Driving Cars". [recording]

Supervision

2022-2023 **Master's Thesis**, *Xinjie Liu, TU Delft*
Thesis title: "On Game-Theoretic Planning with Unknown Opponents' Objectives"

2022 **Master's Project**, *Maximilian Schmidt, TU Delft / TUHH*
Thesis title: "Game-Theoretic Motion Planning on a Real-World Hardware Platform."

Teaching

2021–present **Teaching Assistant: Planning & Decision-Making**, *TU Delft*
Organizing course logistics, designing lecture material, and leading group exercises accompanying the class "Planning & Decision-Making" of the TU Delft Robotics Master program.

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

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

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

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 championships in Germany (2016), Japan (2017), Canada (2018), and Australia (2019).

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 [12].

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.