

Contact Information

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I am a final-year PhD student at Delft University of Technology, where I am co-supervised by Javier Alonso-Mora and Laura Ferranti, focusing on efficient algorithms for multi-agent interaction. Specifically, I am interested in exploiting the game-theoretic structure of multi-agent interaction to learn safe and efficient interaction policies from limited data. Therefore, my research lies at the intersection of numerical optimization, game theory, and machine learning. I ground my work in real-world applications, such as autonomous driving, mobile robotics, and drone racing.

Education

2021 - **Ph.D. Engineering**, *TU Delft*, Delft
Present Advisors: Javier Alonso-Mora and Laura Ferranti
2017 - 2020 **M.Sc. Mechatronics**, *TUHH*, Hamburg
Specialization: Intelligent Systems and Robotics.
2014 - 2017 **B.Sc. Mechanical Engineering**, *TUHH*, Hamburg
Specialization: Theoretical Mechanical Engineering.

Experience

2024 **Visiting Researcher**, *Carnegie Mellon University*, Pittsburgh
Host: Andrea Bajcsy, Robotics Institute, Projects: game-theoretic methods for multi-agent manipulation, latent safety filters [13], safe navigation [1].
2020 - 2021 **Full-Time Researcher**, *University of Bonn*, Bonn
Advisor: Cyrill Stachniss, Photogrammetry & Robotics Lab
2019 **Hybrid Systems Laboratory**, *University of California*, Berkeley
Host: Claire J. Tomlin, Department of Electrical Engineering and Computer Sciences. Project: Master's thesis on game-theoretic planning under uncertainty [14].
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.

Publications

Metrics (as of January 2025)

Citations: 395; h-index: 9; i10-index 8

Peer-Reviewed Conference Publications

- [1] Leonardo Santos*, Zirui Li*, **Lasse Peters**, Somil Bansal*, and Andrea Bajcsy*. "Updating Robot Safety Representations Online from Natural Language Feedback". In: *Proc. of the IEEE Intl. Conf. on Robotics & Automation (ICRA)*. 2025.
- [2] **Lasse Peters***, Xinjie Liu*, Javier Alonso-Mora, Ufuk Topcu, and David Fridovich-Keil. "Auto-Encoding Bayesian Inverse Games". In: *Intl. Workshop on the Algorithmic Foundations of Robotics (WAFR)*. 2024.

- [3] 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: *Proceedings of the Conference on Decision Making and Control (CDC)* (2023).
- [4] **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.
- [5] **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.
- [6] 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 the IEEE Intl. Conf. on Robotics & Automation (ICRA)*. 2020.
- [7] **Lasse Peters**, David Fridovich-Keil, Claire J. Tomlin, and Zachary N. Sunberg. "Inference-Based Strategy Alignment for General-Sum Differential Games". In: *Proceedings of the International Conference on Autonomous Agents and Multi-Agent Systems (AAMAS)*. 2020.

Journals Articles

- [8] **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: *IEEE Robotics and Automation Letters (RA-L)* (2024).
- [9] **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.
- [10] **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).

Workshop Papers

- [11] **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.

Pre-Prints

- [12] Dong Ho Lee, **Lasse Peters**, and David Fridovich-Keil. *You Can't Always Get What You Want: Games of Ordered Preference*. 2025. arXiv: 2410.21447 [cs.GT]. URL: <https://arxiv.org/abs/2410.21447>.
- [13] Kensuke Nakamura, **Lasse Peters**, and Andrea Bajcsy. *Generalizing Safety Beyond Collision-Avoidance via Latent-Space Reachability Analysis*. 2025. arXiv: 2502.00935 [cs.R0]. URL: <https://arxiv.org/abs/2502.00935>.

Miscellaneous

- [14] **Lasse Peters**. "Accommodating Intention Uncertainty in General-Sum Games for Human-Robot Interaction". Master's thesis. Hamburg University of Technology, 2020.
- [15] **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.

*equal contribution.

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".

Professional Activities

Review Committee

ICRA 2023 Workshop on Multi-Robot Learning

External Reviewer

Journal: Science Robotics, TAC, RA-L, L-CSS

Conference: RSS, L4DC, ICRA, IROS, CDC, AAMAS

Invited Talks and Guest Lectures

- 2024 **Invited Talk: Game-Theoretic Models for Multi-Agent Interaction**, *Princeton*
Invited talk on game-theoretic models for multi-agent interaction in the Safe Robotics Lab of Jaime Fisac
- 2024 **Guest Lecture: Game-Theoretic Models for Multi-Agent Interaction**, *Carnegie Mellon University*
Guest lecture on game-theoretic models for multi-agent interaction in Andrea Bajcsy's class "Models & Algorithms for Interactive Robotics", [recording]
- 2022 **Guest Lecture: Uncertainty in Game-Theoretic Planning**, *UT Austin*
Guest lecture on planning under uncertainty in games in David Fridovich-Keil's class "Modeling Multi-Agent Systems".
- 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]

Advising & Mentorship

- 2024-present **Master's Thesis**, *Andrei Papuc, TU Delft*
Thesis title: "Interaction aware autonomous drone racing"
- 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 Projects & Competitions

- 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 [15].
 - 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.