

# Jon Arrizabalaga

Postdoctoral Researcher at Massachusetts Institute of Technology

✉ [jonarri@mit.edu](mailto:jonarri@mit.edu)   [jonarriza96.github.io](https://github.com/jonarriza96)   [Google Scholar](https://scholar.google.com/citations?user=jonarriza96)   [jonarriza96](https://github.com/jonarriza96)   [jonarri](https://www.linkedin.com/in/jonarri)

## Education

<b>PhD</b>	<b>Technical University of Munich</b> , Robotics & Control • <a href="#">Thesis</a> , <a href="#">Defense</a>	2020 – 2025
<b>MSc</b>	<b>KTH Royal Institute of Technology</b> , Mechatronics Engineering • <a href="#">Thesis</a>	2018 – 2020
<b>BSc</b>	<b>University of Navarre</b> , Mechanical Engineering	2014 – 2018

## Academic Experience

<b>Massachusetts Institute of Technology</b>	Postdoctoral Researcher	2026 – present
<b>Carnegie Mellon University</b>	Visiting PhD / Postdoctoral Researcher	2024 – 2026
<b>Charles University</b>	Visiting PhD	2023
<b>Shanghai Jiao Tong University</b>	Visiting Student	2017 – 2018

## Industry Experience

<b>Bosch Research</b>	MSc. Thesis - Robotics Researcher • <a href="#">Paper</a> , <a href="#">Video</a>	2020
<b>Porsche AG</b>	Research Intern	2019

## Honors & Awards

<b>Best Robocup Paper Award (finalist)</b>	2024
5 nominations out of ~4000 submissions at the conference IEEE/RJS IROS • <a href="#">Paper</a> , <a href="#">Talk</a>	
<b>Best PhD Lecturer Award</b>	2022
Recognizes the PhD lecturer who has received the highest evaluations from BSc and MSc students	
<b>Outstanding End-of-Degree Award (finalist)</b>	2018
Honors BSc. students who have excelled in both their academic and extracurricular endeavors	

## Invited Talks

<b>Northeast Systems and Control Workshop</b>	Columbia University	2025
<b>Talking Robotics</b>	Virtual Seminar • <a href="#">Talk</a>	2025
<b>GRASP Laboratory</b>	Vijay Kumar Lab, University of Pennsylvania	2024
<b>German Aerospace Center (DLR)</b>	Institute of Flight Systems	2023
<b>Robotics and Perception Group</b>	University of Zurich	2022

## Teaching

<b>Engineering Mechanics I</b>	Lecturer, Technical University of Munich <i>Level: BSc, Students: 200 ~ 450</i>	2021 – 2024
<b>Mechanics for Aerospace</b>	Lecturer, Technical University of Munich (Asia) <i>Level: MSc, Students: 20 ~ 25</i>	2021 – 2023
<b>Introduction to ROS (Robot Operating System)</b>	Lecturer, Technical University of Munich <i>Level: MSc, Students: 50</i>	2021 – 2022
<b>Dynamics Motion and Control</b>	Teaching Assistant, KTH Royal Institute of Technology <i>Level: MSc, Students: 50</i>	2019 – 2020
<b>Robust Mechatronics</b>	Teaching Assistant, KTH Royal Institute of Technology <i>Level: MSc, Students: 50</i>	2019 – 2020

## Publications

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<b>Implicit Primal-Dual Interior-Point Methods for Quadratic Programming</b> • <a href="#">Paper</a> , <a href="#">Code</a> <i>J. Arrizabalaga</i> , Z. Manchester, Under review	2026
<b>ADMM-based Continuous Trajectory Optimization in Graphs of Convex Sets</b> • <a href="#">Paper</a> L. Pries, <i>J. Arrizabalaga</i> , Z. Manchester, M. Ryll, Under review	2026
<b>DQ-NMPC: Dual-Quaternion NMPC for Quadrotor Flight</b> • <a href="#">Paper</a> , <a href="#">Video</a> , <a href="#">Code</a> , <a href="#">Website</a> L.F. Recalde, D. Agrawal, <i>J. Arrizabalaga</i> , G. Li, RA-L	2025
<b>Convex Maneuver Planning for Spacecraft Collision Avoidance</b> • <a href="#">Paper</a> , <a href="#">Code</a> F. Vega, <i>J. Arrizabalaga</i> , R. Watson, Z. Manchester, IEEE iSpaRo	2025
<b>The Trajectory Bundle Method: Unifying Sequential-Convex Programming and Sampling-Based Trajectory Optimization</b> • <a href="#">Paper</a> K. Tracy, J. Zhang, <i>J. Arrizabalaga</i> , S.Schaal, Y. Tassa, T. Erez, Z. Manchester, IEEE ICRA	2025
<b>Conflict-Based Search as a Protocol: A Multi-Agent Motion Planning Protocol for Heterogeneous Agents, Solvers, and Independent Tasks</b> • <a href="#">Paper</a> , <a href="#">Website</a> R. Veerapaneni,, A. Tang, H. He, S. Zhao, V. Shah, Y. Cen, Z. Ji, G. Olin, <i>J. Arrizabalaga</i> , Y. Shaoul, M. Likhachev Likhachev, IEEE ICRA	2025
<b>A Universal Formulation for Path-Parametric Planning and Control</b> • <a href="#">Paper</a> , <a href="#">Code</a> , <a href="#">Website</a> , <a href="#">Talk</a> <i>J. Arrizabalaga</i> , Z. Sir, Z. Manchester, M. Ryll, IEEE CSM	2025
<b>PHODCOS: Pythagorean Hodograph-based Differentiable Coordinate System</b> • <a href="#">Paper</a> , <a href="#">Code</a> , <a href="#">Talk</a> <i>J. Arrizabalaga</i> , F. Vega, Z. Sir, Z. Manchester, M. Ryll, IEEE Aero	2025
<b>Differentiable Collision-Free Parametric Corridors</b> • <i>Best Paper Finalist</i> • <a href="#">Paper</a> , <a href="#">Code</a> , <a href="#">Video</a> , <a href="#">Talk</a> <i>J. Arrizabalaga</i> , Z. Manchester, M. Ryll, IEEE IROS	2024
<b>Geometric Slesh-Free Tracking for Robotic Manipulators</b> • <a href="#">Paper</a> , <a href="#">Code</a> , <a href="#">Video</a> , <a href="#">Talk</a> <i>J. Arrizabalaga</i> , L. Pries, R. Laha, R. Li, S. Haddadin, M. Ryll, IEEE ICRA	2024
<b>Learning for CasADi: Data-Driven Models in Numerical Optimization</b> • <a href="#">Paper</a> , <a href="#">Code</a> , <a href="#">Talk</a> T. Salzmann, <i>J. Arrizabalaga</i> , J. Andersson, M. Pavone, M. Ryll, L4DC	2023
<b>Pose-Following with Dual Quaternions</b> • <a href="#">Paper</a> , <a href="#">Code</a> , <a href="#">Talk</a> <i>J. Arrizabalaga</i> , M. Ryll, IEEE CDC	2023
<b>SCTOMP: Spatially Constrained Time-Optimal Motion Planning</b> • <a href="#">Paper</a> , <a href="#">Video</a> <i>J. Arrizabalaga</i> , M. Ryll, IEEE IROS	2023
<b>Spatial Motion Planning with Pythagorean Hodograph curves</b> • <a href="#">Paper</a> , <a href="#">Video</a> , <a href="#">Talk</a> <i>J. Arrizabalaga</i> , M. Ryll, IEEE CDC	2022
<b>Towards Time-Optimal Tunnel-Following for Quadrotors</b> • <a href="#">Paper</a> , <a href="#">Video</a> <i>J. Arrizabalaga</i> , M. Ryll, IEEE ICRA	2022
<b>Real-Time Neural-MPC: Deep Learning Model Predictive Control for Quadrotors and Agile Robotic Platforms</b> • <a href="#">Paper</a> , <a href="#">Code</a> T. Salzmann, E. Kaufmann, <i>J. Arrizabalaga</i> , M. Pavone, D. Scaramuzza, M. Ryll, RA-L	2022
<b>A caster-wheel-aware MPC-based motion planner for mobile robotics</b> • <a href="#">Paper</a> , <a href="#">Thesis</a> , <a href="#">Video</a> <i>J. Arrizabalaga</i> , N. van Duijkeren, M. Ryll, R. Lange, IEEE ICAR	2021

## Students Mentored

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<b>Viraj Shah</b> , Research Project, <i>now at</i> Carnegie Mellon University	2025
<b>Eden Cen</b> , Research Project, <i>now at</i> Carnegie Mellon University	2025
<b>Akshay Jaitly</b> , Research Project, <i>now at</i> Worcester Polytechnic Institute	2025
<b>Luis Fernando Recalde</b> , Research Project, <i>now at</i> Worcester Polytechnic Institute	2024
<b>Giuseppe Soldati</b> , Semester Thesis, <i>now at</i> German Aerospace Center (DLR)	2023
<b>Harun Tongay Tamtürk</b> , Semester Thesis & MSc. Thesis, <i>now at</i> Airbus Defence and Space	2023

<b>Bruno Sorban</b> , Research Project, <i>now at</i> Boston Consulting Group	2023
<b>Tommaso Faraci</b> , Research Project, <i>now at</i> Universita di Trento	2022

## Extracurricular Projects

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<b>Ascent - Rocket Hopper</b> , Guidance and Control Lead • <a href="#">Website</a>	2022 – 2024
<b>The Juggling Robot Project</b> , Team Lead • <a href="#">Video</a>	2019 – 2020
<b>Formula Student Electric</b> , Vehicle Dynamics Engineer	2016 – 2018

## Review Activities

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- IEEE Transactions on Robotics (T-RO)
- IEEE Robotics and Automation Letters (RA-L)
- IEEE Transactions on Systems, Man, and Cybernetics: Systems (T-SMC)
- Robotics Science and Systems (RSS)
- IEEE International Conference on Robotics and Automation (ICRA)
- IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)
- IEEE Conference on Decision and Control (CDC)
- IEEE International Conference on Humanoid Robots (Humanoids)
- IEEE International Conference on Space Robotics (iSpaRo)