

Gage MacLin

gage-maclin@uiowa.edu

EDUCATION

The University of Iowa, Iowa City, IA
Ph.D. in Mechanical Engineering
Advisor: Venanzio Cichella

Expected Spring 2027

The University of Iowa, Iowa City, IA
M.S. in Mechanical Engineering
B.S. in Mechanical Engineering

Fall 2024
Spring 2023

PROFESSIONAL EXPERIENCE

Cooperative Autonomous Systems Lab
Graduate Research Assistant

Fall 2023 - Current
Iowa City, IA

- Conduct fundamental research in optimal control, motion planning, and learning-based autonomy for safety-critical systems, with an emphasis on real-time trajectory generation and collision-free multi-agent planning.

Amazon Robotics
Applied Scientist Co-op

January 2026 - August 2026
Westborough, MA

- Conducted novel research on safe motion planning applied to real robotic systems, including quadruped navigation and robotic arm manipulation.

NASA Langley Research Center
Graduate Research Intern

Summers 2024-2025
Hampton, VA

- Developed a trajectory classification algorithm for real-time trajectory generation and prediction for autonomous aircraft, resulting in a series of conference papers.
- Conducted various multi-aircraft experiments in a motion capture-equipped lab, testing trajectory generation and collision avoidance capabilities.

United States Navy
Graduate Research Intern

Summer 2023
Panama City, FL

- Leveraged robot operating system (ROS) knowledge to orchestrate and execute collaborative missions between autonomous vehicles.
- Led a group of five undergraduate interns and delegated responsibilities towards the completion of a common research project.

Cooperative Autonomous Systems Lab
Undergraduate Research Assistant

January 2022 - May 2023
Iowa City, IA

- Designed and implemented advanced trajectory tracking and path following algorithms for an autonomous underwater vehicle (AUV) resulting in the publication of a peer-reviewed journal paper.

John Deere
Engineering Intern

Summers 2019-2022
Waterloo, IA

- Obtained a well-rounded understanding of many facets of the manufacturing process, including product design, verification & validation, production, and quality control.

TEACHING EXPERIENCE

Department of Mechanical Engineering

Teaching Assistant

- ME:3600 Control of Mechanical Engineering Systems Fall 2026
- ME:6115 Cooperative Autonomous Systems Fall 2023
- ME:4120 Advanced Linear Control Systems Spring 2023
- ME:3600 Control of Mechanical Engineering Systems Fall 2022

AWARDS AND FELLOWSHIPS

John F. Kennedy Memorial Fellowship	Fall 2023 - Spring 2026
NASA ISGC Graduate Fellowship	Fall 2023 - Spring 2026
NASA ISGC Undergraduate Research Scholarship	Fall 2022 - Spring 2023
Archibald A. Alexander Memorial Scholarship	Fall 2022 - Spring 2023
Frederic G. Higbee Memorial Scholarship	Fall 2020 - Spring 2021
John Deere Early Talent Program Scholarship	Fall 2019 - Spring 2021

JOURNAL PUBLICATIONS

1. Vladimir Petrov, **Gage MacLin**, and Venanzio Cichella. "Adaptive Reference Management and Model Predictive Control for Near-Surface Depth-Heading Control of Autonomous Underwater Vehicles" *Ocean Engineering* 368 128400 (2026)
2. Vladimir Petrov, **Gage MacLin**, and Venanzio Cichella. "Underwater vehicle autopilot system for controlling depth and pitch: Maneuvering through near-surface waves and environmental disturbances." *Ocean Engineering* 317 119910 (2025)
3. **Gage MacLin**, Maxwell Hammond, Venanzio Cichella, and J. Ezequiel Martin. "Modeling, simulation and maneuvering control of a generic submarine." *Control Engineering Practice* 144 105792 (2024)
4. Maxwell Hammond, **Gage MacLin**, Venanzio Cichella, and Laurent Jay. "Solutions to Differential Algebraic Inequalities with Composite Bernstein Polynomials." *SIAM Journal of Scientific Computing* (submitted)

CONFERENCE PROCEEDINGS

1. Amisha Bhaskar, **Gage MacLin**, Camilla Tabasso, Leo Lin, Pratap Tokekar, Venanzio Cichella, Tye Brady, and Taskin Padir. "PolyFusion: Collision-Free Robot Learning using Bernstein Polynomials." 10th Conference on Robot Learning (CoRL). (to appear)
2. **Gage MacLin***, Marco Bibuli, and Venanzio Cichella. "Adaptive Reference Control for Depth Regulation of a Biomimetic Robotic Fish." 2026 IFAC World Congress. (2026)
3. Nick Gorman, **Gage MacLin**, and Venanzio Cichella. "Solving Geodesic Equations with Composite Bernstein Polynomials for Trajectory Planning." 2026 IEEE Aerospace Conference. (2026)
4. Michael Acheson, Andrew Patterson, Kasey Ackerman, Thomas Britton, Newton Campbell, Irene M. Gregory, Daniel Hill, Tanavi Nakamura-Zimmerer, Benjamin Simmons, **Gage MacLin**, Mia Scoblic, and Venanzio Cichella. "Baseball Avoidance Multirotor Simulation" 2026 AIAA SciTech Forum. (2026)
5. **Gage MacLin***, Venanzio Cichella, Andrew Patterson, and Irene Gregory. "Real-Time Optimal Control via Transformer Networks and Bernstein Polynomials." IEEE 64th Conference on Decision and Control (CDC). (2025)

6. Maxwell Hammond, **Gage MacLin***, Amirreza Fahim Golestaneh, and Venanzio Cichella. "Scalable Trajectory Planning for Multi-Agent Systems Using Continuum Mechanics and Bernstein Polynomials." IEEE 64th Conference on Decision and Control (CDC). (2025)
7. **Gage MacLin***, Andrew Patterson, Irene Gregory, and Venanzio Cichella. "Transformer-Enabled Leg-Based Trajectory Generation for Autonomous Aircraft Near Airports." AIAA AVIATION Forum. (2025)
8. Maxwell Hammond, **Gage MacLin***, and Venanzio Cichella. "Adaptive Reference Management and Model Predictive Control for Near-Surface Operations of Autonomous Underwater Vehicles." IFAC 16th Conference on Control Applications in Marine Systems, Robotics and Vehicles. (2025)
9. **Gage MacLin***, Andrew Patterson, Venanzio Cichella, Michael Acheson, and Irene Gregory. "Optimal Control using Composite Bernstein Approximants." IEEE 63rd Conference on Decision and Control (CDC). (2024)
10. Vladimir Petrov, **Gage MacLin**, and Venanzio Cichella. "Autopilot System for Depth and Pitch Control in Underwater Vehicles: Navigating Near-Surface Waves and Disturbances." IFAC 15th Conference on Control Applications in Marine Systems, Robotics and Vehicles. (2024)
11. **Gage MacLin**, Mason Peterson, Camilla Tabasso, Joshua Migdal, Venanzio Cichella, Tye Brady, and Taskin Padir. "Continuous-Time Safe Planning and Control for Agile Quadrupeds." 2027 IEEE International Conference on Robotics and Automation (ICRA). (submitted)
12. Mason Peterson, **Gage MacLin**, Camilla Tabasso, Joshua Migdal, Tye Brady, and Taskin Padir. "Open-World Object Motion Anticipation via Meta-Learning for Safe Robot Navigation." 2027 IEEE International Conference on Robotics and Automation (ICRA). (submitted)
13. Nick Gorman, **Gage MacLin**, and Venanzio Cichella. "Model Predictive Planning: Real-time, Control-Agnostic Path Planning Across Three UAV Controllers" 2027 IEEE Aerospace Conference. (submitted)

* - presenting author

OTHER TECHNICAL PUBLICATIONS

1. Andrew Patterson, **Gage MacLin**, Michael Acheson, Camilla Tabasso, Venanzio Cichella, and Irene Gregory. "On Hermite Interpolation using Bernstein Polynomials for Trajectory Generation." NASA Technical Memorandum 20230013467 (2023).
2. **Gage MacLin**, Venanzio Cichella, Andrew Patterson, Michael Acheson, and Irene Gregory. "Optimal Control using Composite Bernstein Approximants", *Bernstein/Bezier Polynomials in Control, Estimation, and Planning* (to appear)

PROFESSIONAL SERVICE

Journal Reviewer

- Automatica; Transactions on Automation Science and Engineering; Journal of Guidance, Control, and Dynamics; Control Systems Letters; Nonlinear Dynamics; Scientific Reports; Journal of Intelligent and Robotic Systems; Journal of Aerospace Engineering; International Journal of Dynamics and Control; International Journal of Intelligent Robotics and Applications; Discover Applied Sciences

Conference Reviewer

- American Control Conference (ACC); IEEE International Conference on Robotics and Automation (ICRA); IFAC World Congress; IEEE Conference on Control Technology and Applications (CCTA); IFAC Control Applications in Marine Systems, Robotics, and Vehicles (CAMS)

MISCELLANEOUS

Talk, Amazon Research Conference, Boston, MA, Summer 2026

Session Co-Chair, IFAC CAMS 2025