

CURRICULUM VITAE

THE WILLIAM STATES LEE COLLEGE OF ENGINEERING
THE UNIVERSITY OF NORTH CAROLINA AT CHARLOTTE

NAME: ARTUR WOLEK

DATE: OCTOBER 1, 2025

TITLE: ASSISTANT PROFESSOR

DEPARTMENT: MECHANICAL ENGINEERING AND ENGINEERING SCIENCE

OFFICE LOCATION: 103 BATT CAVE RESEARCH BUILDING
8415 PHILLIPS RD., CHARLOTTE, NC 28263
EMAIL: AWOLEK@CHARLOTTE.EDU
WEBSITE: ARSL.CHARLOTTE.EDU

DATE OF FIRST EMPLOYMENT AT UNC CHARLOTTE: AUGUST 2020

EDUCATION

Ph.D. in Aerospace Engineering, Virginia Tech, Blacksburg, VA May 2015
Focus Area: Dynamics and Control
Dissertation: "Optimal paths in gliding flight"
Advisor: Dr. Craig A. Woolsey

B.S. in Aerospace Engineering (magna cum laude), Virginia Tech, Blacksburg, VA May 2010

EXPERIENCE

Academic Positions

Assistant Professor 08/20 – present
Department of Mechanical Engineering and Engineering Science
NC Battery Complexity, Autonomous Vehicle & Electrification (BATT CAVE) Research Center,
Air Research Innovation (Charlotte AIR) Institute,
The University of North Carolina at Charlotte, Charlotte, NC

Maryland Robotics Center (MRC) Postdoctoral Fellow 06/18 – 07/20
Department of Aerospace Engineering and Institute for Systems Research
University of Maryland, College Park, MD
Advisor: Dr. Derek A. Paley

Adjunct Lecturer 01/17 – 05/18
Department of Electrical Engineering and Computer Science
The Catholic University of America, Washington, DC

American Society For Engineering Education (ASEE) Postdoctoral Fellow 05/15 – 06/18
Physical Acoustics Branch (Code 7130), Acoustics Division
U.S. Naval Research Laboratory, Washington, DC
Advisor: Dr. Benjamin R. Dzikowicz

Graduate Research Assistant
Kevin T. Crofton Department of Aerospace and Ocean Engineering
Virginia Tech, Blacksburg, VA
Advisor: Dr. Craig A. Woolsey

08/10 – 05/15

Industry Positions and Consulting

Consultant, KeyW Corporation, Washington, DC
(Research related to underwater vehicle autonomy)

08/18 – 11/18

Consultant, Global Strategies and Transformation, Herndon, VA
(Research related to missile defense)

05/13 – 08/13

Systems Engineering Intern, Aurora Flight Sciences, Manassas, VA
(Statistical analysis of predicted technical performance for Orion UAV)

05/10 – 08/10

TEACHING ACCOMPLISHMENTS

Courses Offered

[1] MEGR 4090/5090: Astromechanics, UNC Charlotte

Introduction to astromechanics. Newton's law of gravitation. The two-body problem and types of orbits. Kepler's Laws. Orbital elements. Orbit determination. Orbit transfers (Hohmann, gravitational assist). Energy and time-of-flight relations. Interplanetary trajectories (patched conic approximation). Spacecraft mission design.

- Spring 2026

[2] MEGR 2090: Introduction to Aerospace Engineering, UNC Charlotte

A new undergraduate course that I developed that introduces students to aerospace engineering, including aerodynamics, structures/materials, propulsion, aircraft performance/stability, and space systems.

- Fall 2025: 34 students

[3] MEGR 4090/5090: Uncrewed Aerial Vehicles, UNC Charlotte

A new undergraduate course that I developed that covers fundamental concepts and technologies related to the dynamics, control, navigation, and guidance of uncrewed aerial vehicles (UAVs). Historical background, laws/regulations, reference frames, principles of GNSS, rotation matrices, aerodynamic forces and moments, longitudinal motion simulation in MATLAB/Simulink, flight stability concepts, basic PID and autopilot concepts (successive loop closure), Dubins paths, proportional navigation.

- Spring 2025: 37 students; evaluation score 4.6/5.0

[4] MEGR 7090/8090: Dynamic System Learning and Estimation, UNC Charlotte

A new graduate course that I developed that includes a review of linear systems and probability theory, observability, Luenberger observer, system ID via least-square parameter estimation and stepwise model determination, maximum likelihood estimation, Kalman filters (discrete-time, continuous-time, extended KF, unscented KF), recursive Bayesian estimation, particle filters, machine-learning-based regression (neural networks and Gaussian processes) for dynamic system modeling, and dynamic mode decomposition.

- Fall 2024: 8 students; evaluation score: 5.0/5.0
- Fall 2022: 11 students; evaluation score: 4.91/5.0

[5] MEGR 3122: Dynamic Systems II, UNC Charlotte

An undergraduate course on linear systems modeling and analysis, including: review of 1st and 2nd Order ODEs, solutions via Laplace transform, MATLAB simulation, damped harmonic oscillator, transfer functions, mechanical system models, lumped parameter models, basic thermal and electrical system models, sinusoidal transfer function, resonance, vibration isolators, vibrations modes, vibration absorbers, Bode diagrams, introduction to block diagrams and PID control.

- Spring 2024: 40 students; evaluation score: 4.32/5.0
- Spring 2023: 75 students; evaluation score: 4.41/5.0 (Sec. 001), 3.80/5.0 (Sec. 002)
- Spring 2022: 45 students; evaluation score: 4.88/5.0
- Spring 2021: 40 students; evaluation score: 4.55/5.0

[6] MEGR 3121: Dynamic Systems I, UNC Charlotte

An undergraduate course on Newtonian mechanics, including: particle kinematics and kinetics (2D), reference frames (rectangular, polar, path), relative motion, constrained motion, work/energy, linear and angular momentum, impulse, power and efficiency, 2D rigid body dynamics, energy, and momentum.

- Fall 2025: 43 students
- Fall 2024: 44 students; evaluation score: 3.62/5.0
- Fall 2023: 65 students; evaluation score: 4.20/5.0
- Fall 2022: 37 students; evaluation score: 4.60/5.0
- Fall 2021: 45 students; evaluation score: 3.71/5.0

[7] CSC/EE 576: Introduction to Robotics, Catholic University of America

A graduate course focusing on motion planning for robotic systems, including: bug algorithms, configuration spaces, forward/inverse kinematics for manipulators, potential fields, cell decompositions, probabilistic roadmaps, tree-based motion planning (RRT, EST, etc.), robot locomotion and equations of motion, open-loop control, closed-loop (PID) control, uncertainty and error propagation.

- Fall 2017: 14 students; evaluation score: 6.43/7.0

[8] ENGR 204: Programming Robots and Sensors, Catholic University of America

A new undergraduate course that I developed that introduced students to programming and mechatronics through lectures and six laboratory exercises. Topics covered included: types of robots and applications, locomotion, homogeneous coordinates and transformations, simulating equations of motion, sensor technologies, intro. random vectors and uncertainty, intro. feedback control, intro. motion planning. Labs: hands-on programming and prototyping of circuits and programming a mobile robot Zumo 32U4 in the Arduino (C++ based) language.

- Spring 2018: 9 students; evaluation score: 6.50/7.0
- Spring 2017: 12 students; evaluation score: 6.70/7.0

**Evaluation scores are the mean response to student survey question concerning instructor effectiveness*

Curriculum Development at UNC Charlotte

- New course development:
 - MEGR 4090/5090: Astromechanics (first offered Spring 2026)
 - MEGR 2090: Introduction to Aerospace Engineering (first offered Fall 2025)
 - MEGR 4090/5090: Uncrewed Aerial Vehicles (first offered Spring 2025)
 - MEGR 7090/8090: Dynamic System Learning and Estimation (first offered Fall 2022)
- Led effort to establish MEES Aerospace Engineering Concentration (Spring 2024–Spring 2025)
- Assisted with MEES Mechatronics I/II lecture and lab development (Spring 2024–present)
- Assisted with MEES/ECE graduate control courses (cross-listing, syllabi, and schedule coordination), Fall 2023

Guest Lectures

- “Applications of Image Data Collection and Processing in Unmanned Systems Research,” ECGR 6118/8118: Applied Digital Image Processing, University of North Carolina at Charlotte, Charlotte, NC, Course Instructor: Dr. Andrew Willis, 19 March 2025.
- “Autonomous Quadrotors: Adaptive Sampling and Autonomy,” ENAE 788M: Hands On Autonomous Aerial Robotics, University of Maryland, College Park, MD, Course Instructors: Nitin Sanket and Chahat Singh, 12 November 2019.

- “Autonomous Quadrotors: Adaptive Sampling and Autonomy,” ENSE 698E: Sensor Systems, University of Maryland, College Park, MD, Course Instructors: Dr. David Lovell and Dr. Pamela Abshire, 7 November 2019, 8 November 2018.

Teaching Assistant Assignments at Virginia Tech (from 2010–2015)

- AOE 3054: Aerospace Experimental Lab
- AOE 4134: Astromechanics
- AOE 3104: Aircraft Performance
- AOE 4404: Applied Numerical Methods
- AOE 3134: Aircraft Stability and Control
- AOE 5744: Nonlinear Systems Theory

Students Advised

Undergraduate Students (B.S. honors thesis/project reader):

- [1] Kyle VanHorn, Mechanical Engineering, Advisor (Graduated 2025)
- [2] Kayla Lenz, Mechanical Engineering, Advised by Dr. C. Lee (Graduated 2022)

Undergraduate Students Mentored at UNC Charlotte:

- [1] Piper Floyd, B.S.M.E., volunteer (08/24–12/24), NSF grant (01/25–05/25)
- [2] Madison Hasley, B.S.M.E., volunteer (08/24–01/25), OUR Research Scholar Program (01/25–06/25)
- [3] Cedric Davis, B.S.M.E., OUR Research Scholar Program and NSF grant (09/23–05/25)
- [4] Nguyen (Matt) Nguyen, OUR Research Scholar Program and NSF grant (09/23–05/25)
- [5] Kyle VanHorn, B.S.M.E., OUR Research Scholar Program and NSF grant (05/23–05/25). Awarded the Distinguished Undergraduate Researcher Award by the MEES Student Awards Committee.
- [6] Calum Lashley, B.S.M.E., OUR Research Scholar Program (08/24–12/24)
- [7] Grayson Taylor, B.S.M.E., OUR Research Scholar Program (08/24–10/24)
- [8] Conor McCourt, B.S.M.E., visiting student volunteer from Virginia Tech (05/24–07/24)
- [9] Joey Porter, B.S.M.E., OUR Research Scholar Program (05/24–07/24)
- [10] Ryan Monroe, B.S.M.E., OUR Research Scholar Program (05/24–07/24)
- [11] Sam De Simone, B.S.M.E., volunteer (02/24–05/24)
- [12] Dillon Freer, B.S.M.E., volunteer (09/23–05/24)
- [13] Ryan Jacobik, B.S.A.E., visiting student from UT-Knoxville through SERVE Program (05/23–07/23)
- [14] Aidan Brendle, B.S.M.E., volunteer (03/23–06/23)
- [15] Jonathan Blanton, B.S.M.E., OUR Research Scholar Program (08/22–11/22)
- [16] Matthew Lucke, B.S.M.E., volunteer (01/21–03/22)
- [17] Connor Davidson, B.S.M.E., OUR Summer Scholar Program (06/21–08/21)
- [18] Jacob Armiger, B.S.C.S., visiting student from UT-Knoxville through SERVE Program (06/21–08/21)
- [19] John Driver, B.S.M.E., volunteer (10/20–07/21)
- [20] Jacob Harrison, B.S.M.E., volunteer (11/20–05/21)

Undergraduate Students Mentored at University of Maryland (co-mentored with Dr. Derek Paley)

- [21] Madeline Brode*, Poolesville High School, (05/20–09/20)
- [22] Sanjana Mayenkar*, Poolesville High School, (05/20–09/20)

- [23] Jenny Mei*, B.S.E.C.E., (06/19–05/20)
- [24] Charles Flanagan*, B.S.A.E., (05/19–09/20) Honors Program
- [25] Ian Moss, B.S.A.E. *, (09/18–05/19), AEROS/ASPIRE Program
- [26] Aniket Goel, B.S.A.E. *, (09/18–05/19), Honors Program
- [27] Joshua Yuan, B.S.A.E. *, (06/18–08/18 and 06/19–08/19)

Graduate Students (thesis/dissertation committee member, not including my own students):

- [1] Harshil Suthar, M.S. in Electrical Engineering, “Value-of-information guided joint path-planning and communication for multi-agent teaming,” Supervised by Dr. D. Maity (Defended: 07/25)
- [2] Arash Rahmanidehkordi, Ph.D. in Mechanical Engineering, “Design and implementation of a constraint-aware controller for nonlinear and uncertain systems: A traffic density management application,” Supervised by Dr. A. Ghasemi (Proposal: 05/25)
- [3] Matthew Shockley, M.S. in Mechanical Engineering, “Exploring the parameter space for the generalized Chaplygin beanie with dissipation,” Supervised by Dr. S. Kelly (Defended: 04/25)
- [4] Andrew Boctor, M.S. in Mechanical Engineering, “Mixed-aged battery pack performance,” Supervised by Dr. A. Bombik (Proposal: 02/25)
- [5] Cortney Hahn, M.S. in Mechanical Engineering, “Simulating vortex ring dynamics for UAVs landing on mobile platforms: A CFD approach,” Supervised by Dr. M. Uddin (Defended: 12/24)
- [6] Philip Brown, M.S. in Mechanical Engineering, “Particle tracking applications of vibrating grains using thermal imaging filtration,” Supervised by Dr. R. Keanini (Defended: 11/24)
- [7] Ashish Pujari, Ph.D. in Mechanical Engineering, “Symmetry detection and exploitation in deep reinforcement learning,” Supervised by Dr. S. Kelly (Proposal: 08/24)
- [8] Hamidreza Moradi, Ph.D. in Mechanical Engineering, “Mobile robots sharing dynamic environments: Mechanical communication and motion control,” Supervised by Dr. S. Kelly (Proposal: 08/24)
- [9] Daniel Saraphis, Ph.D. in Mechanical Engineering, “Enhancing human-automation teaming through learning based multistage model predictive control,” Supervised by Dr. A. Ghasemi (Proposal: 05/24)
- [10] Surabhi Parab, M.S. in Electrical and Computer Engineering, “Multiphysics synthesis of blast phenomenon,” Supervised by Dr. A. Willis (Defended: 04/24)
- [11] Aryan Gupta, M.S. in Electrical and Computer Engineering, “Risk-aware planning in partially known environments,” Supervised by Dr. D. Maity (Proposal: 10/23)
- [12] Joe Tolone, M.S. in Mechanical Engineering, “Implementation of consensus alternating direction method of multipliers in a model predictive control problem with applications in traffic networks,” Supervised by Dr. A. Ghasemi (Defended: 05/23)
- [13] Pouria Shahri, Ph.D. in Mechanical Engineering, “Designing hierarchical infrastructure-based traffic control frameworks for large-scale heterogeneous traffic networks,” Supervised by Dr. A. Ghasemi (Defended: 12/23)
- [14] Frank Lawless, M.S. in Electrical and Computer Engineering, “Trajectory tracking control for nonholonomic robots with actuation noise and imperfect communication,” Supervised by Dr. D. Maity (Defended: 11/22)
- [15] Saurav Agarwal, Ph.D. in Computer Science, “Generalized coverage using multiple robots: theory, algorithms, and experiments,” Supervised by Dr. S. Akella (Defended: 04/22)
- [16] Vahid Izadi, Ph.D. in Mechanical Engineering, “Towards explainable robots: Developing consensus reaching mechanisms for co-robots in haptic shared control paradigms,” Supervised by Dr. A. Ghasemi (Defended: 04/22)
- [17] Mason Slingluff, M.S. in Mechanical Engineering, “Aerodynamic stability analysis of quadcopters subject to unsteady wind conditions,” Supervised by Dr. M. Uddin (Defended: 07/21)
- [18] Will Timms, M.S. in Mechanical Engineering, “Aerodynamics of UAV ground effect interactions,” Supervised by Dr. M. Uddin (Defended: 05/21)

Graduate Students (graduated, committee chair):

- [1] Alex Nikonowicz, M.S. in Mechanical Engineering, “Inland bathymetry surveying with uncrewed surface vessels: Performance characterization and risk-aware path planning”, 05/2023 –04/2025.
- [2] Jacob Herbert, M.S.in Mechanical Engineering, “Design and system identification of a miniature underwater vehicle for controls research”, 08/2021–07/2023. [Thesis PDF] (Next position: Teledyne FLIR)
- [3] Michael Brancato, M.S. in Mechanical Engineering, “Autonomous sensing of a Gaussian spatial process with multiple heterogeneous agents”, 08/2020–06/2022. [Thesis PDF] (Next position: Draper Laboratories)

Graduate Students (current, committee chair):

- [1] Dustin Simms (incoming Ph.D. student in Mechanical Engineering, Joining August 2025).
- [2] Andrew McPartland, M.S. student in Mechanical Engineering, Joined Fall 2024.
- [3] Collin Hague, Ph.D. candidate in Mechanical Engineering, “Occlusion-aware Path Planning for Uncrewed Aerial Vehicles”, Joined Fall 2021, Proposal: Oct. 2025.
- [4] Nicholas Kakavitsas, Ph.D. candidate in Mechanical Engineering, “Autonomous Quadrotors in Uncertain Disturbances: Control, Estimation, and Path Planning”, Joined Fall 2021, Proposal: April 2025.

Other Graduate Student Mentored (independent study projects, non-thesis culminating research):

- [1] Jordane Williams, M.S.in Mechanical Engineering, UNC Charlotte, (mentored 08/2024–11/2024)
- [2] Riley McBride, M.S.in Mechanical Engineering, UNC Charlotte, (mentored 01/2022–10/2023)
- [3] Kalan Petrea, M.S.in Mechanical Engineering, UNC Charlotte, (mentored 08/2020–04/2021)

RESEARCH ACCOMPLISHMENTS

Summary: 23 journal articles and book chapters and 39 conference proceedings published or submitted
 Google Scholar [Link]

Journal Publications (submitted)

- [1] A. Nikonowicz[†] and A. Wolek, “Performance characterization of a small portable uncrewed surface vessel for bathymetry mapping near bridges using a single-beam echosounder.” Submitted.
- [2] A. Nikonowicz[†] and A. Wolek, “A survey of uncrewed surface vessels for inland bathymetric data collection by U.S. state transportation agencies.” Submitted.
- [3] N. Kakavitsas[†], A. Willis, D. Maity, and A. Wolek, “A quadrotor dynamic model in response to an explosive blast,” Submitted.
- [4] C. Hague[†], and A. Wolek, “Occlusion-aware ground target tracking by a Dubins vehicle using visibility volumes,” Submitted. Preprint: <https://arxiv.org/pdf/2506.03400>
- [5] A. Wolek, I. E. Weintraub, A. Von Moll, D. Casbeer, and S.G. Manyam, “Risk-aware autonomy for managing weapon engagement zones,” Submitted.
- [6] C. Hague[†], A. Willis, D. Maity, and A. Wolek, “Minimum-time Dubins airplane tours to inspect targets with visibility and dwell time constraints,” Submitted.

Journal Publications (peer-reviewed)

- [7] M. Brancato[†] and A. Wolek, “Adaptive sampling of a stationary Gaussian spatial process by a team of robots with heterogeneous dynamics and measurement noise variance,” *IEEE Access*, 12:94407–94423, 2024. DOI: 10.1109/ACCESS.2024.3425430
- [8] J. Zhang, A. Wolek, and A. Willis, “UAV-borne mapping algorithms for low-level and high-speed drone applications.” *Sensors*, 24(7):1-22, 2024. DOI: 10.3390/s24072204
- [9] J. Jimenez, D. Stilwell, A. Wolek, J. McMahon, and B. Dzikowicz, “Improved multitarget tracking in the presence of port-starboard measurement ambiguity using the Bayes factor,” *IEEE Journal of Oceanic Engineering*, 48(1):199-217, 2023. DOI: 10.1109/JOE.2022.3193734

- [10] A . Wolek, J. McMahon, B. R. Dzikowicz, and B. H. Houston, "Tracking multiple surface vessels with an autonomous underwater vehicle: field results," *IEEE Journal of Oceanic Engineering*, 47(1):32-45, 2022.
DOI: 10.1109/JOE.2020.3015415
- [11] D . A. Paley, A. A. Thompson, A. Wolek, and P. Ghanem, "Planar formation control of a school of robotic fish: Theory and experiments," *Frontiers in Control Engineering*, 2:782121, 2021.
DOI: 10.3389/fcteg.2021.782121
- [12] A . Wolek, J. McMahon, B. R. Dzikowicz, and B. H. Houston, "The orbiting Dubins traveling salesman problem: planning inspection tours for a minehunting AUV." *Autonomous Robots*, 45(1), 31-49, 2021.
DOI: 10.1007/s10514-020-09946-5
- [13] A . Wolek, S. Cheng, D. Goswami, and D. A. Paley, "Cooperative mapping and target search over an unknown occupancy graph using mutual information," *IEEE Robotics and Automation Letters*, 5(2):1071-1078, 2020.
DOI: 10.1109/LRA.2020.2966394
- [14] A . Wolek, B. R. Dzikowicz, J. McMahon, and B. H. Houston, "At-sea evaluation of an underwater vehicle behavior for passive target tracking," *IEEE Journal of Oceanic Engineering*, 44(2):514-523, 2019.
DOI: 10.1109/JOE.2018.2817268
- [15] M . A. Wilson, J. McMahon, A. Wolek, D. Aha, and B. H. Houston, "Goal reasoning for autonomous underwater vehicles: responding to unexpected agents," *AI Communications* 31(2):151-166, 2018.
DOI: 10.3233/AIC-180755
- [16] A . Wolek, E. M. Cliff, and C. A. Woolsey, "Time-optimal path planning for a kinematic car with variable speed," *AIAA Journal of Guidance, Control, and Dynamics*, 39(10):2374-2390, 2016.
DOI: 10.2514/1.G001317
- [17] A . Wolek, E. M. Cliff, and C. A. Woolsey, "Energy-optimal paths for a glider with speed and load factor controls," *AIAA Journal of Guidance, Control, and Dynamics*, 39(2):397-405, 2016.
DOI: 10.2514/1.G001345
- [18] A . Wolek and C. A. Woolsey, "Optimal paths in still air for a sailplane with a quadratic glide polar," *Technical Soaring*, 40(2):9-23, 2016.
- [19] A . Wolek and C. A. Woolsey, "Feasible Dubins paths in the presence of unknown, unsteady velocity disturbances," *AIAA Journal of Guidance, Control, and Dynamics*, 38(4):782-787, 2015.
DOI: 10.2514/1.G000629
- [20] O . Bilgen, L. Butt, S. Day, C. Sossi, J. Weaver, A. Wolek, W. Mason, and D. Inman, "A novel unmanned aircraft with solid-state control surfaces," *Journal of Intelligent Material Systems and Structures*, 24(2):147-167, 2012.
DOI: 10.1177/1045389X12459592

Book Chapters and Other Journal Publications:

- [21] A . Wolek and D. A. Paley, "A 3D underwater robotic collective called Blueswarm," *Science Robotics*, 6(50):eabf4315, 2021. (2 pages)
DOI: 10.1126/scirobotics.abf4315
- [22] D . A. Paley and A. Wolek, "Mobile sensor networks and control: Adaptive sampling of spatiotemporal processes," *Annual Reviews: Control, Robotics, and Autonomous Systems*, 3:91-114, 2020.
DOI: 10.1146/annurev-control-073119-090634
- [23] A . Wolek and C. A. Woolsey, "Model-based path planning," in *Sensing and Control for Autonomous Vehicles*, (Eds: T. Fossen, K. Pettersen, H. Nijmeijer), Springer Lecture Notes in Control and Information Science, pp.183-206, 2017.
DOI: 10.1007/978-3-319-55372-6_9

Conference Publications (accepted based on full paper peer-review):

- [1] I . Albool, A. Willis, A. Wolek, and D. Maity, "A reinforcement learning framework to adaptively schedule controllers for UAVs operating under harsh environmental conditions", *Proc. 2025 International Conference on Unmanned Aerial Systems (ICUAS)*, pp. 1125–1131, Charlotte, NC, 14–17 May 2025.
DOI: 10.1109/ICUAS65942.2025.11007841

- [2] C . Beam, A. Wolek, and A. Willis, “Recreation of 3D UAS flights in high-realism virtual environments”, *Proc. 2025 International Conference on Unmanned Aerial Systems (ICUAS)*, pp. 393-399, Charlotte, NC, 14–17 May 2025.
DOI: 10.1109/ICUAS65942.2025.11007798
- [3] S . Parab, A. Wolek, D. Maity, and A. Willis, “Real-time simulation of complex 4D wind fields and gusts for UAS control system development”, *Proc. 2025 International Conference on Unmanned Aerial Systems (ICUAS)*, pp. 681–688, Charlotte, NC, 14–17 May 2025.
DOI: 10.1109/ICUAS65942.2025.11007887
- [4] A . Wolek, I. E. Weintraub, A. Von Moll, D. Casbeer, and S.G. Manyam, “Sampling-based risk-aware path planning around dynamic engagement zones,” *Proc. 2024 Modeling, Estimation and Control Conference (MECC)*, Chicago, IL, USA, 28–30 October, 2024. (6 pages)
DOI: 10.1016/j.ifacol.2025.01.030
- [5] H . Moradi, A. Wolek, S. D. Kelly, “Mechanics and control of a freely rolling two-link robot with joint actuation,” *Proc. 2024 Modeling, Estimation and Control Conference (MECC)*, Chicago, IL, USA, 28–30 October, 2024. (6 pages)
DOI: 10.1016/j.ifacol.2025.01.118
- [6] A . Wolek, “Path planning for a cooperative navigation aid vehicle to assist multiple agents sequentially,” *IFAC-PapersOnLine 58 (20)*, 133–138, Presented at the *15th IFAC Conference on Control Applications in Marine Systems, Robotics, and Vehicles (CAMS)*, Blacksburg, Virginia, USA, September 3–5, 2024.
DOI: 10.1016/j.ifacol.2024.10.044
- [7] A . Wolek, J. McMahon, “ Batch estimation of a steady, uniform, flow-field from ground velocity and heading measurements,” *IFAC-PapersOnLine 58 (20)*, 307–312, Presented at the *15th IFAC Conference on Control Applications in Marine Systems, Robotics, and Vehicles (CAMS)*, Blacksburg, Virginia, USA, September 3–5, 2024.
DOI: 10.1016/j.ifacol.2024.10.071
- [8] A . Wolek, D. Casbeer, I. Weintraub, A. Von Moll, “Maximum kinetic energy paths for a decaying-speed Dubins vehicle,” *Proc. 2025 AIAA Science and Technology Forum and Exposition (SciTech)*, Orlando, FL, 6–10 January, 2025. (20 pages)
DOI: 10.2514/6.2025-1351
- [9] C . Beam, J. Zhang, N. Kakavitsas[†], C. Hague[†], A. Wolek, and A. Willis, “Cesium Tiles for high-realism simulation and comparing SLAM results in corresponding virtual and real-world environments.” *Proc. IEEE SoutheastCon 2024*, Atlanta, GA, 15–24 March 2024. (6 pages)
DOI: 10.1109/SoutheastCon52093.2024.10500076
- [10] A . Willis, C. Hague[†], A. Wolek, and K. Brink, “GPU-Accelerated 3D polygon visibility volumes for synergistic perception and navigation,” *Proc. IEEE SoutheastCon 2024*, Atlanta, GA, 15–24 March 2024. (6 pages)
DOI: 10.1109/SoutheastCon52093.2024.10500285
- [11] C. Hague[†], N. Kakavitsas[†], J. Zhang, C. Beam, A. Willis, and A. Wolek, “Design and flight demonstration of a quadrotor for urban mapping and target tracking applications,” *Proc. IEEE SoutheastCon 2024*. 15–24 March 2024. (6 pages)
DOI: 10.1109/SoutheastCon52093.2024.10500131
- [12] J. Herbert[†], and A. Wolek, “Design of a miniature underwater vehicle and data collection system for indoor experimentation,” *Proc. IEEE SoutheastCon 2024*, Atlanta, GA, 15–24 March 2024. (6 pages)
DOI: 10.1109/SoutheastCon52093.2024.10500036
- [13] N. Kakavitsas[†], A. Willis, R. Jacobik, M. Uddin, and A. Wolek, “Quadrotor flight simulation in a CFD-generated urban wind field,” in *Proc. 2024 IEEE Aerospace Conference (AeroConf)*, Big Sky, Montana, 2–9 March 2024. (8 pages)
DOI: 10.1109/AERO58975.2024.10521032
- [14] N. Kakavitsas[†], A. Willis, J. Conrad, and A. Wolek, “Comparison of size and performance of small vertical and short takeoff and landing UAS,” in *Proc. 2024 IEEE Aerospace Conference (AeroConf)*, Big Sky, Montana, 2–9 March 2024. (14 pages)
DOI: 10.1109/AERO58975.2024.10521006

- [15] A . Wolek and D. A. Paley, "Output feedback formation control of a school of robotic fish with artificial lateral line sensing," *Proc. IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, pp. 4715–4720, Detroit, MI, 1–5 October 2023.
DOI: 10.1109/IROS55552.2023.10342055
- [16] D . Goswami, A. Wolek, and D. A. Paley, "Data-driven estimation using an echo-state neural network equipped with an Ensemble Kalman Filter," in *Proc. 2021 American Control Conference (ACC)*, pp.2549-2554, New Orleans, LA, 25–28 May 2021.
DOI: 10.23919/ACC50511.2021.9483373
- [17] P . Ghanem, A. Wolek, and D. A. Paley, "Planar formation control of a school of robotic fish," in *Proc. 2020 American Control Conference (ACC)*, pp.1653-1658, Denver, CO, 1–3 July 2020.
DOI: ACC45564.2020.9147969
- [18] H . Yetkin, J. McMahon, N. Topin, A. Wolek, Z. Waters, and D. Stilwell, "Online planning for autonomous underwater vehicles performing information gathering tasks in large subsea environments," *Proc. IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Macau, China, 4–8 November 2019. (8 pages).
DOI: 10.1109/IROS40897.2019.8967898
- [19] B. Simmons[‡], P. Adwani[‡], H. Pham[‡], Y. Alhuthifi[‡], and A. Wolek, "Training a remote-control car to autonomously lane-follow using end-to-end neural networks," in *Proc. IEEE 53rd Annual Conference on Information Science and Systems*, Baltimore, MD, 20-22 March 2019. (6 pages).
DOI: 10.1109/CISS.2019.8692851
- [20] J . McMahon, H. Yetkin, A. Wolek, Z. Waters, and D. J. Stilwell, "Towards real-time search planning in subsea environments," in *Proc. IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, pp.87-94, Vancouver, Canada, 24–28 September 2017.
DOI: 10.1109/IROS.2017.8202142
- [21] A . Wolek and C. A. Woolsey, "Disturbance rejection in Dubins path planning," in *Proc. 2012 American Control Conference (ACC)*, pp. 4873-4878, Montreal, Canada, 27–29 June 2012.
DOI: 10.1109/ACC.2012.6315582

Conference Publications (accepted based on extended abstract):

- [22] Z . Hashemi, D. Maity, and A. Wolek, "POWER-Net: Predictive optimization and wave energy regulation in networked WEC systems". *Proc. 2025 University Marine Energy Research Community (UMERC) Annual Conference, Corvallis, OR, 12–15 August 2025*.
- [23] C . Hahn, A. Wolek, A. Misar, and M. Uddin, "Characterizing vortex ring state during UAV landing on a ground vehicle using CFD," *Proc. 2025 AIAA Science and Technology Forum and Exposition (SciTech)*, Orlando, FL, 6–10 January, 2025. (22 pages)
DOI: 10.2514/6.2025-1686
- [24] N. Kakavitsas[†], M. Uddin, and A. Wolek, "Mapping urban wind fields via Gaussian processes regression models that consider building morphology," *Proc. 2025 AIAA Science and Technology Forum and Exposition (SciTech)*, Orlando, FL, 6–10 January, 2025. (19 pages)
DOI: 10.2514/6.2025-2282
- [25] N. Kakavitsas[†], A. Willis, D. Maity, A. Wolek, "A quadrotor model for evaluating dynamic response to a blast pressure wave," *Proc. 2025 AIAA Science and Technology Forum and Exposition (SciTech)*, Orlando, FL, 6–10 January, 2025. (16 pages)
DOI: 10.2514/6.2025-0659
- [26] N. Kakavitsas[†] and A. Wolek, "Quadrotor takeoff trajectory planning in a one-dimensional uncertain wind-field aided by wind-sensing Infrastructure," in *Proc. AIAA Science and Technology Forum and Exposition (SciTech)*, Paper No. AIAA 2024-0987, Orlando, FL, 8–12 January 2024. (18 pages)
DOI: 10.2514/6.2024-0987
- [27] C. Hague[†], A. Willis, D. Maity, and A. Wolek, "Planning visual inspection tours for a 3D Dubins airplane model in an urban environment," in *Proc. AIAA Science and Technology Forum and Exposition (SciTech)*, Paper No.

AIAA 2023-0108, National Harbor, MD, 23–27 January 2023. (18 pages).
DOI: 10.2514/6.2023-0108

- [28] J. G. Jimenez, A. Wolek, D. Stilwell, J. McMahon, and B. R. Dzikowicz “Experimental results in bearings-only tracking with the sequential Monte-Carlo probability hypothesis density filter,” in *Proc. SPIE Vol. 11018, Signal Processing, Sensor/Information Fusion, and Target Recognition XXVIII*, Baltimore, MD, 14–18 April 2019. (14 pages).
DOI: 10.1117/12.2519047
- [29] M. A. Wilson, J. McMahon, A. Wolek, D. Aha, and B. Houston, “Toward goal reasoning for AUVs: responding to unexpected agents,” in *Proc. 4th Workshop on Goal Reasoning at the 25th International Joint Conference Artificial Intelligence (IJCAI)*, New York, NY, 9 July 2016. (8 pages)
- [30] A. Wolek, T. Gode, C. A. Woolsey, J. Quenzer, K. A. Morgansen, “Testing a pneumatic underwater glider in shallow water,” in *Proc. MTS/IEEE OCEANS’15 Conference and Exposition*, Washington, DC, October 2015. (8 pages).
DOI: 10.23919/OCEANS.2015.7401980
- [31] O. Bilgen, L. Butt, S. Day, C. Sossi, J. Weaver, A. Wolek, W. Mason, and D. Inman, “A novel unmanned aircraft with solid-state control surfaces,” in *Proc. 52nd AIAA Structural Dynamics and Materials Conference*, number AIAA-2011-2071, Denver, CO, 4–7 April 2011. (24 pages).
DOI: 10.2514/6.2011-2071
- [32] L. Butt, S. Day, C. Sossi, J. Weaver, A. Wolek, O. Bilgen, W. Mason, and D. Inman, “Wing morphing design utilizing macro-fiber composite smart materials,” in *Proc. 69th Annual Conference of The Society of Allied Weight Engineers (SAWE)*, number 3515-S, Virginia Beach, VA, 22–26 May 2010. (61 pages)
- [33] A. Wolek, J. Burns, C. A. Woolsey, J. Quenzer, L. Techy, and K. A. Morgansen, “A maneuverable, pneumatic underwater glider,” in *Proc. MTS/IEEE OCEANS’12 Conference and Exposition*, Hampton Roads, VA, 14–19 October 2012. (7 pages).
DOI: 10.1109/OCEANS.2012.6404989
- [34] S. Fan, A. Wolek, and C. A. Woolsey, “Stability and performance of underwater gliders,” in *Proc. MTS/IEEE OCEANS’12 Conference and Exposition*, Hampton Roads, VA, 14–19 October 2012. (10 pages)
DOI: 10.1109/OCEANS.2012.6404993
- [35] M. C. Cotting, A. Wolek, J. F. Murtha, and C. A. Woolsey, “Developmental flight testing of the SPAARO UAV,” in *Proc. 48th AIAA Aerospace Sciences Meeting and Exposition*, Paper No. AIAA 2010-295, Orlando, FL, 4–7 January 2010. (16 pages)
DOI: 10.2514/6.2010-295
- [36] J. F. Murtha, M. C. Cotting, A. Wolek, T. Aarons, and C. A. Woolsey, “The educational impact of creating a new UAV for curriculum enhancement,” in *Proc. AIAA Atmospheric Flight Mechanics Conference*, Paper No. AIAA 2009-5851, Chicago, IL, 10–13 August 2009. (19 pages)
DOI: 10.2514/6.2009-5851

Undergraduate Student Conference Publications Directed (accepted based on abstract):

- [37] M. Nguyen[†], “Off-road terrain mapping for autonomous ground vehicle energy-optimal path planning,” *AIAA 2025 Region II Student Conference*, Greensboro, NC, 3–4 April 2025. (11 pages). [Link]
DOI: 10.2514/6.2025-99132
- [38] K. VanHorn[‡], “Experimental characterization of a quadrotor’s response to an air vortex cannon,” *AIAA 2025 Region II Student Conference*, Greensboro, NC, 3–4 April 2025. (11 pages) [1st place award in Undergraduate Research Competition – Stan Powell Award] [Link]
- [39] K. VanHorn[‡], “Machine-learning-based wind detection and avoidance using a crazyflie micro drone,” *AIAA 2024 Region II Student Conference*, Kennedy Space Center, FL, 4–5 April 2024. (11 pages)
DOI: 10.2514/6.2024-85491

Underline indicates student supervised (graduate [†] or undergraduate [‡]);

Technical Reports

- [1] A. Nikonowicz, and A. Wolek, "Evaluation of USV Technology for Bathymetric Surveying of Inland Environments," Project FHWA/NC/2024-20 Final Report, North Carolina Department of Transportation, 2025.
- [2] J. W. McMahon, B. Dzikowicz, P. Amy, B. Houston, and A. Wolek, "NRL Boston 2018 autonomy experiment results and analysis," U.S. Naval Research Laboratory, Internal Report, 2019. (31 pages)
- [3] A. Wolek, T. Gode, C. A. Woolsey, J. Quenzer, and K. A. Morgansen, "Design and testing of a pneumatically propelled underwater glider," Virginia Center For Autonomous Systems, Report No. VaCAS-2015-01, 2015. (99 pages)

Inventions

- [1] Algorithms for planning inspection tours for a minehunting autonomous underwater vehicle. Joint Invention with James McMahon. U.S. Naval Research Laboratory, Intellectual Property Disclosure No. 111334-US1, 17 June 2019.
- [2] Information-based cooperative mapping and target search. Joint Invention with Derek Paley and Sheng Cheng. University of Maryland, Intellectual Property Disclosure No. IS-2019-062, 31 May 2019.

Poster Presentations

- [1] M. Hasley* and A. Wolek, "Developing an indoor marine robotics testbed for multi-robot navigation and control," *Spring 2025 UNC Charlotte Undergraduate Research Conference*, Charlotte, NC, 17 April 2025.
- [2] Z. Hashemi*, D. Maity, and A. Wolek, "Maximizing power generation of wave energy converter farms through coupled control and estimation," *2025 North Carolina Renewable Ocean Energy Program*, Wanchese, NC, 26 March 2024.
- [3] C. Lashley* and A. Wolek, "Design of a source-seeking marine hovercraft robot and control algorithm," *Fall 2024 UNC Charlotte Undergraduate Research Conference*, Charlotte, NC, 02 August 2024.
- [4] J. Porter* and A. Wolek, "Design of a buoyancy control system for a miniature aquatic robot," *Summer 2024 UNC Charlotte Undergraduate Research Conference*, Charlotte, NC, 02 August 2024.
- [5] R. Monroe* and A. Wolek, "Autonomous surface vessel (ASV): field testing and sensor integration," *Summer 2024 UNC Charlotte Undergraduate Research Conference*, Charlotte, NC, 02 August 2024.
- [6] N. Nguyen* and A. Wolek, "3D off-road terrain mapping for autonomous ground vehicle energy-optimal path planning," *2024 UNC Charlotte Undergraduate Research Conference*, Charlotte, NC, 12 April 2024.
- [7] C. Davis* and A. Wolek, "Vision-based ping-pong ball anemometer," *2024 UNC Charlotte Undergraduate Research Conference*, Charlotte, NC, 12 April 2024.
- [8] A. Nikonowicz* and A. Wolek, "Evaluation of unmanned surface vessel technology for bathymetric surveying of inland environments," *2024 Geospatial Information Systems (GIS) Day at UNC Charlotte*, Charlotte, NC, 15 November 2023. (1st Place Award.)
- [9] K. VanHorn* and A. Wolek, "Wind detection and avoidance using a crazyflie micro drone," *2023 UNC Charlotte Undergraduate Research Conference*, 08 August 2023.
- [10] C. Davidson* and A. Wolek, "Integrating an ultrasonic anemometer onboard a quadrotor drone for wind data collection," *2023 UNC Charlotte Undergraduate Research Conference*, 30 July 2021.
- [11] J. Driver* and A. Wolek, "Characterizing radio communication range for an autonomous surface vessel" at the *Summer 2021 UNC Charlotte Undergraduate Research Conference*, 30 July 2021.
- [12] J. Armiger* and A. Wolek, "Identifying the steering dynamics of an autonomous surface vessel" at the *Summer 2021 UNC Charlotte Undergraduate Research Conference*, 30 July 2021.
- [13] J. Harrison* and A. Wolek, "Characterizing the acoustic signature of a quadrotor in hovering flight" at the *2021 UNC Charlotte Undergraduate Research Conference*, 12 April 2021. (virtual event)
- [14] A. Thompson*, A. Wolek, and D. A. Paley, "Bioinspired sensory and control principles for underwater multi-vehicle coordination," *2021 Maryland Robotics Center Research Symposium*, College Park, MD, 25 May 2021.
- [15] A. Thompson*, A. Wolek, and D. A. Paley, "Bioinspired sensory and control principles for underwater multi-vehicle coordination," *Robotics-inspired Biology Workshop*, 2020 IEEE/RSJ International Conference on Intelligent Robots and Systems, Las Vegas, NV, 25 October 2020.

- [16] A. Wolek, S. Cheng, and D. A. Paley. “Multi-vehicle control and autonomy for swarming quadrotors,” *Naval Postgraduate School: xSwarm 2020*, (Abstract accepted for presentation, event cancelled), 2020.
- [17] K. Bhatu, T. Brosh, J. Bukhari, A. Del Colliano, A. Edwards, K. Jain*, S. Katragadda, Z. Lacey, A. Modi, I. Moss*, D. A. Paley, K. Rawal, R. Singh, Q. Wei, and A. Wolek, “The UMD autonomous micro air vehicle team,” *Do Good Robotics Symposium*, University of Maryland, College Park, MD, 3 October 2019.
- [18] A. Wolek*, S. Cheng, D. Goswami and D. A. Paley, “Cooperative mapping and target search over a unknown occupancy graph using mutual information,” *Northeast Robotics Colloquium*, University of Pennsylvania, Philadelphia, PA, 12 October, 2019.
- [19] A. Wolek*, S. Cheng, D. Goswami and D. A. Paley, “Cooperative mapping and target search over a unknown occupancy graph using mutual information,” *Postdoctoral Research Symposium*, University of Maryland, College Park, MD, 13 September, 2019. (Honorable Mention Award)
- [20] A. Wolek*, S. Cheng, D. Goswami and D. A. Paley, “Cooperative mapping and target search over a unknown occupancy graph using mutual information,” *Computer Science Research Review Day*, University of Maryland, College Park, MD, 22 August, 2019.

*Presenting author(s)

Oral Presentations and Seminars (not including oral presentations for papers listed under conference proceedings)

- [1] A. Wolek, “Optimizing spatial data collection with autonomous aerial and marine robots,” Infrastructure and Environmental Systems (INES) Seminar, UNC Charlotte, Charlotte, NC, 15 September, 2025.
- [2] D. Casbeer*, C. Taylor, A. Wolek, I. Weintraub, A. Von Moll, S. G. Manyam, “Threat aware path planning: Flight test experimentation,” 2025 AIAA Defense Forum, Johns Hopkins APL, Laurel, MD, 17 April 2025.
- [3] N. Kakavitsas*, K. VanHorn, A. Wolek, “Machine learning to improve multirotor UAV flight in windy urban environments,” AI Workshop, Department of Mechanical Engineering and Engineering Science, UNC Charlotte, 25 April 2024.
- [4] I. Weintraub*, A. Wolek, A. Von Moll, D. Casbeer, S. G. Manyam, “Deterministic risk-aware path planning around multiple threats,” 2024 AIAA Defense Forum, Johns Hopkins APL, Laurel, MD, 16 April 2024.
- [5] A. Wolek, “Autonomous marine vehicles: platforms, capabilities, and enabling algorithms,” Defense Alliance of North Carolina (DANC) Science and Technology Forum: Defense Technology Showcase, UNC Charlotte, Charlotte, NC, 21 March, 2024.
- [6] A. Wolek, “Efficient bathymetric surveying with a team of unmanned surface vessels via adaptive sampling,” NCDOT Research & Innovation Summit 2023, Raleigh, NC, 29 March, 2023.
- [7] A. Wolek, “Motion planning algorithms for autonomous data collection with unmanned vehicles,” UNC Charlotte, Getting to Know Your Terrestrial Remote Sensing Community @ UNCC, Charlotte, NC, 17 February, 2023.
- [8] A. Wolek, “Extensions of Dubins path planning,” UNC Charlotte, Robotics and Controls Seminar, Charlotte, NC, 4 March, 2022.
- [9] A. Wolek, “Efficient sensing trajectories for autonomous underwater vehicles,” UNC Charlotte, 1st N.C. Marine Initiative Forum, Charlotte, NC, 7 March, 2021.
- [10] A. Wolek, S. Cheng, D. Goswami, and D. A. Paley, “Cooperative mapping and target search over an unknown occupancy graph using mutual information,” IEEE International Conference on Robotics and Automation, Paris, France, 31 May, 2020. (Presented virtually; talk corresponding to article in IEEE Robotics and Automation Letters).
- [11] A. Wolek, “Optimal and sensor-driven motion planning for unmanned vehicles,” University of Alabama in Huntsville, MAE Department, Huntsville, AL, 10 March, 2020.
- [12] A. Wolek, “Optimal and sensor-driven motion planning for unmanned vehicles,” Washington State University, MME School, Pullman, WA, 3 March, 2020.
- [13] A. Wolek, “Optimal and sensor-driven motion planning for unmanned vehicles,” The University of North Carolina at Charlotte, MEES Department, Charlotte, NC, 24 February, 2020.

- [14] A. Wolek, "Optimal and sensor-driven motion planning for unmanned vehicles," Auburn University, AE Department, Auburn, AL, 19 February, 2020.
- [15] A. Wolek, "Optimal and sensor-driven motion planning for unmanned vehicles," Missouri University of Science and Technology, MAE Department, Rolla, MO, 14 February, 2020.
- [16] A. Wolek, "Optimal and sensor-driven motion planning for unmanned vehicles," University of Virginia, MAE Department, Charlottesville, VA, 12 April, 2018.
- [17] A. Wolek, "Optimal and sensor-driven motion planning for unmanned vehicles," North Carolina State University, MAE Department, Raleigh, NC, 27 March, 2018.
- [18] A. Wolek, "Optimal and sensor-driven motion planning for unmanned vehicles," University of Tennessee – Knoxville, MABE Department, Knoxville, TN, 6 March, 2018.
- [19] A. Wolek, "Optimal and sensor-driven motion planning for unmanned vehicles," University of Kentucky, ME Department, Lexington, KY, 28 February, 2018.
- [20] A. Wolek, "Optimal and sensor-driven motion planning for unmanned vehicles," Iowa State University, AE Department, Ames, IA, 15 February, 2018.
- [21] A. Wolek, "Optimal and sensor-driven motion planning for unmanned vehicles," University of Georgia, ECE School, Athens, GA, 7 February, 2018.
- [22] A. Wolek, "Optimal and sensor-driven motion planning for unmanned vehicles," University of New Hampshire, ME Department, Durham, NH, 26 January, 2018.
- [23] A. Wolek, "Optimal and sensor-driven motion planning for unmanned vehicles," West Virginia University, MAE Department, Morgantown, WV, 9 January, 2018.
- [24] A. Wolek, "Optimal and sensor-driven motion planning for unmanned vehicles," Auburn University, AE Department, Auburn, AL, 7 December, 2017.
- [25] A. Wolek, Ben Dzikowicz, James McMahon, Mark Wilson, "NRL autonomy architecture: reactive behaviors," Naval Surface Warfare Center, Autonomy, Dynamics, and Special Programs Branch, Panama City, FL, 10 Jan. 2017
- [26] A. Wolek and C. A. Woolsey, "Model-based path planning," Springer Workshop on Sensing and Control of Autonomous Vehicles, Alesund, Norway, 20 June, 2017.
- [27] A. Wolek, "Advancing vehicle autonomy: System designs, path planning, and decision making, " Naval Air Systems Command, Aeromechanics Division, Patuxent River, MD, 16 December, 2016.
- [28] A. Wolek, "Underwater gliders in the coastal ocean: Planning, control, design and field trials," Naval Research Laboratory, Physical Acoustics Branch, Washington, DC, 19 November, 2014.
- [29] A. Wolek, "Underwater gliders in the coastal ocean: Planning, control, design and field trials," Virginia Tech, AOE Departmental Seminar, Blacksburg, VA, 17 November, 2014
- [30] A. Wolek, "Underwater gliders in the coastal ocean: Planning, control, design and field trials," Virginia Tech, SIAM Student Chapter Seminar, Blacksburg, VA, 29 October, 2014
- [31] A. Wolek, "Underwater gliders in the coastal ocean: Planning, control, design and field trials," Virginia Tech, Virginia Center for Autonomous Systems (VaCAS) Seminar, Blacksburg, VA, 1 October, 2014
- [32] A. Wolek, "Underwater gliders in significant currents," ONR Joint Review of Unmanned Systems Technology, Panama City Beach, FL, 28 January 2014

FUNDING

Externally Sponsored Research at UNC Charlotte

Summary: Total as PI or Co-PI \$1,329,074; Wolek component*: \$680,084; Total as PI: \$492,053

- [1] Proposal Title: Precision Control of High-speed Autonomous Vehicles under High Disturbances (Phase II)
 Investigators: D. Maity, A. Willis (PI), A. Wolek (Co-PI)
 Sponsor: Department of Army STTR (Subcontract from Corvid Technologies)
 Period of Performance: April 16, 2025 – April 9, 2027 (2 years)
 Amount: \$657,468
 Wolek Component: \$216,964 (33%)

- [2] Proposal Title: Maximizing Power Generation of Wave Energy Converter Farms through Coupled Control and Estimation
 Investigators: D. Maity (PI), A. Wolek (Co-PI)
 Sponsor: Coastal Studies Institute (CSI)
 Period of Performance: July 1, 2024 – June 30, 2025 (1 year)
 Amount: \$63,614
 Wolek Component: \$31,807 (50%)

- [3] Proposal Title: Precision Control of High-speed Autonomous Vehicles under High Disturbances (Phase I)
 Investigators: D. Maity, A. Willis (PI), A. Wolek (Co-PI)
 Sponsor: Department of Army STTR (Subcontract from Corvid Technologies)
 Period of Performance: December 1, 2023 – May 31, 2024 (6 months)
 Amount: \$115,939
 Wolek Component: \$38,260 (33%)

- [4] Proposal Title: ERI: Wind Field Estimation and Path Planning for Uncrewed Aircraft in Urban Environments (Award No. 2301475)
 Investigators: M. Uddin, A. Wolek (PI)
 Sponsor: National Science Foundation
 Period of Performance: September 1, 2023 – August 31, 2025 (2 years)
 Amount: \$199,904
 Wolek Component: \$186,488 (93%)

- [5] Proposal Title: Evaluation of Unmanned Surface Vessel Technology for Bathymetric Surveying of Inland Environments (Award No. 2024-20)
 Investigators: A. Wolek (PI)
 Sponsor: NC Department of Transportation
 Period of Performance: August 1, 2023 – July 30, 2025 (2 years)
 Amount: \$125,149

- [6] Proposal Title: Cooperative Flight Path Planning for UAS in an Uncertain Gaussian Process Wind Field Model under Chance Constraints
 Investigators: A. Wolek (PI)
 Sponsor: AFOSR Summer Faculty Fellowship Program
 Period of Performance: June 5, 2023 – August 8, 2023 (3 months)
 Amount: \$17,000 (stipend)

- [7] Proposal Title: Autonomous Systems and Robotics
 Investigators: J. Conrad, A. Willis, A. Wolek (PI)
 Sponsor: DEFENSEWERX
 Period of Performance: April 13, 2023 – December 5, 2023 (8 months)
 Amount: \$150,000
 Wolek Component: \$ 51,000 (34%)

**Wolek component calculated from project budget or Niner Research “Allocation of Credit / PI F&A” percentages*

UNC Charlotte Internally Sponsored Research

- [1] Proposal Title: Center for Geospatial Sensing and Analytics (GeoSAN)—Paving a Geospatial Way to Top Tier Research Excellence
 Investigators: W. Tang (PI), A. Wolek (Co-PI), and 39 other Co-PIs.
 Sponsor: UNC Charlotte Ignite for Centers Grants (IC) Program
 Period of Performance: July 1, 2023 – June 30, 2024 (1 year)
 Amount: \$10,000

- [2] Proposal Title: SwarmTank: A Testbed For Cooperative Control of Unmanned Underwater Vehicles
 Investigators: A. Wolek

Sponsor: UNC Charlotte Faculty Research Grant
Period of Performance: July 1, 2022 – December 31, 2023 (1.5 years)
Amount: \$8,000.

- [3] Proposal Title: Variable Resolution Information Optimized Perception Planning and Control for Multi-Robot Systems
Investigators: D. Maity (PI), A. Willis, A. Wolek (Co-PI)
Sponsor: UNC Charlotte Multidisciplinary Team Initiation Grant
Period of Performance: February 1, 2022 – July 30, 2022 (6 months)
Amount: \$9,988

Other Sponsored Research (Prior to joining UNC Charlotte)

- [1] Proposal Title: Autonomous Minehunting: Maximizing the Information Value of Survey Routes for UUVs
Investigators: A. Wolek
Sponsor: ASEE/NRL Postdoctoral Fellowship Program
Period of Performance: 05/2015 – 06/2018 (3 years)
Amount: \$255,000 (total stipend)

Equipment Donations Facilitated

- [1] Equipment: Epson SCARA Robot Model G6-651S and accessories
Provided by: Carter's Machine Co., Inc.
Date: October 2024
Value: \$25,011.21

Other Unfunded Collaborations Based on Competitive Proposal Acceptance

- [1] Proposal Title: Determination Real-Time of Energy-Management for Aircraft Maneuverability – Project Have DREAM
Investigators: Jessica “STING” Peterson (USAF TPS; PI), Isaac Weintraub (AFRL), A. Wolek (Co-PI)
Organization: United States Air Force Test Pilot School (Edwards, AFB)
Period of Performance: April 2, 2025 – October 1, 2025 (7 months)

SERVICE

Committee Assignments (university, college, and departmental)

- SPX Distinguished Scholar/Professor and Director of BATT CAVE Search (Chair: Dr. Q. Zhu), Fall 2025–present, member
- University Library Atkins Library's Open Access Advisory Committee, AY 2025–2026
- CEFO's College of Engineering Broadening Participation Committee (CEBPC), AY 2025–2026, member
- CEFO's College of Engineering Computing Facilities Advisory Committee (CFAC), AY 2023–2024, member
- SPX Distinguished Scholar/Professor and Director of BATT CAVE Search (Chair: Dr. Q. Zhu), Fall 2024–Spring 2025, member
- Departmental Faculty Search Committee (Chair: Dr. J. Xu), Spring 2021–Fall 2021, member
- Departmental Review Committee (Chair: Dr. P. Ramaprabhu), Fall 2020–Spring 2021, non-voting member

Other Campus Service and Outreach

- College of Engineering Seed Funding Reviewer, February 2025
- MEES Representative, Quality Enhancement Plan (QEP), A2C STEM Partner Meeting, 17 November 2023
- Organizer (with AIAA/DBF Student Team): Rubber Band Helicopter Activity, UNC Charlotte College of Engineering: Discover Engineering Event, Charlotte, USA, 15 April 2023.

- MEES Department, Ph.D. qualifying exam (Dynamics) exam preparation and grading, Fall 2023
- MEES Department, Ph.D. qualifying exam (Control) exam preparation and grading, Fall 2023, Spring 2024
- MEES Department, Ph.D. qualifying exam (Mathematics) exam preparation and grading, Spring 2022, Spring 2024, Spring 2025, Fall 2025
- MEES Department, Dynamics and Control Focus Area Improvement Team (FAIT), 2021–present
- BATT CAVE Center: Visitor Demonstrations, Tours, and Outreach, Spring 2023 – present. (demos/events, including visitors from Office Manufacturing and Energy Supply Chain (MESCC), RTI Innovation, Army Research Office (ARO), Charlotte Regional Legislative Caucus, 2023 EV Battery Safety Workshop, Albermarle Middle School, Grant Williams Family Foundation, Telra Institute, Honeywell, Charlotte Business Journal, 2024 North Carolina Battery Technology Workshop, Hendrick Motorsports, Doosan Bobcat, Cabbarus County Public Schools, West Charlotte High School, and other industry, government, and community visitors/events)
- College of Engineering, Albert Engineering Leadership Scholarship, Spring 2023, reviewer
- UNC Charlotte’s Undergraduate Research Conference (URC) 2022, Spring 2022, faculty judge
- Robotics and Controls Seminar @ UNC Charlotte (Co-Organizer), Fall 2022–present
- Graduate School Summer Fellowship (GSSF) program committee, Spring 2021, reviewer

Other External Service and Outreach

- Instructor (with Dr. Anthony Bombik), “NAC024: Aerospace Engineering Camp,” a new week-long camp co-developed and offered through the Camps-on-Campus Program at UNC Charlotte, 23–27 June 2025.
- Outreach, “Techies” FIRST LEGO League Challenge (FLLC) Team #37633, October 2024.
- Outreach, “Cybotz Robotics” FIRST Tech Challenge (FTC) Team #21351, August 2024.
- Member, Flight Forward Program, Sullenberger Aviation Museum, May 2024–Sep 2025.
- Reviewer, NC Space Grant, Graduate Research Fellowship Program, Spring 2024.
- Judge, Student Paper Competition, AIAA 2023 Region II Student Conference, Knoxville, Tennessee, USA, 27 March 2023. (Participated remotely.)
- Judge, VRC 2019 Capital Beltway Challenge (VEX Robotics Tournament), Eleanor Roosevelt High School, Greenbelt, MD, 21 December 2019.
- Organizer (with Dr. Derek Paley and Laura Paquin), Workshop: Design, Build, and Fly Remote-Controlled Blimps, 3 February 2019 (Adat Shalom Synagogue) and 9 February 2019 (Travilah Elementary School), University of Maryland, College Park, MD.

Undergraduate Design Teams Advised:

- [1] “AIAA Design-Build-Fly competition,” *MEGR 3255/3256: Senior Design*, 5 students, UNC Charlotte, Fall 2025.
- [2] “Development of a hands-on project for the mechatronics curriculum,” *MEGR 3255/3256: Senior Design*, 5 students, UNC Charlotte, Fall 2025. (Co-advised with Dr. Stuart Smith)
- [3] “Maximizing power generation of wave energy converter farms,” *MEGR 3255/3256: Senior Design*, 5 students, UNC Charlotte, Fall 2024–Spring 2025. (Co-advised with Dr. Dipankar Maity and Dr. Nan BouSaba)
- [4] “AIAA Design-Build-Fly competition,” *MEGR 3255/3256: Senior Design*, 5 students, UNC Charlotte, Fall 2024–Spring 2025.
- [5] “Compact low-cost snake-like mobile robot,” *MEGR 3255/3256: Senior Design*, 5 students, UNC Charlotte, Fall 2023–Spring 2024. (Co-advised with Dr. Scott Kelly)
- [6] ASME EFX Old Guard Oral Competition, UNC Charlotte, 2024, Faculty advisor
- [7] “Passive robotic locomotion via ambient energy harvesting,” *MEGR 3255/3256: Senior Design*, 5 students, UNC Charlotte, Spring 2023–Fall 2023. (Co-advised with Dr. Scott Kelly)
- [8] “Mechanical communication between mobile robots coupled through a compliant medium,” *MEGR 3255/3256: Senior Design*, 5 students, UNC Charlotte, Fall 2022–Spring 2023. (Co-advised with Dr. Scott Kelly)

- [9] “Mechanical communication between mobile robots in a shared aquatic medium,” *MEGR 3255/3256: Senior Design*, 5 students, UNC Charlotte, Spring 2022–Fall 2022. (Co-advised with Dr. Scott Kelly)
- [10] “Design of an autonomous manufacturing process within a robotic CNC cell,” *MEGR 3255/3256: Senior Design*, 5 students, UNC Charlotte, Fall 2020–Spring 2021. (Sponsor: Siemens Energy, Inc.)
- [11] “Fish-inspired buoyancy control system,” *SUMM 071: Aerospace Engineering Profession*, Junior Endeavor Transfer (JET) Program, Course project, 3 students, Spring 2020. (Co-advised with Dr. Derek Paley at Univ. Maryland)
- [12] “Flight dynamics and control for an autonomous quadrotor,” *ENAE 100: Aerospace Engineering Profession*, Course project, 8 students, Fall 2018, Fall 2019. (Co-advised with Dr. Derek Paley at Univ. Maryland)
- [13] “Training a remote-control car to autonomously lane follow using end-to-end neural networks,” *EE/CSC 491/2: Senior Design*, Course project, 4 students, Fall 2016–Spring 2017. (Co-advised with Dr. Ozlem Kilic at Catholic University)

Student Club Faculty Advisor:

- [1] AIAA Design, Build, Fly (DBF), UNC Charlotte Student Club, April 2022–present, Faculty advisor.
- [2] American Institute of Aeronautics and Astronautics (AIAA), UNC Charlotte Student Branch, April 2022–present, Faculty advisor.
- [3] UMD Autonomous Micro-Air Vehicle (AMAV) team, competing in The Vertical Flight Society Annual Micro Air Vehicle Student Challenge, 15 students, 2018-2020. (1st Place, Autonomous, 2019; 2nd Place, Combined manual/autonomous, 2020). (Co-advised with Dr. Derek Paley at Univ. Maryland)

Ad hoc Reviewer for Journals (50+ journal manuscripts reviewed to date):

• Autonomous Robots	2021
• IFAC Automatica	2024
• Journal of Atmospheric and Oceanic Technology	2017
• AIAA Journal of Aerospace Information Systems	2015
• AIAA Journal of Guidance, Control, and Dynamics	2013, 2015, 2017–2019, 2023, 2025
• ASME Letters in Dynamic Systems and Control	2019, 2024
• Bioinspiration & Biomimetics	2020
• Extreme Mechanics	2024
• IEEE Control Systems Letters	2020
• IEEE Journal of Oceanic Engineering	2018, 2019, 2021, 2024
• IEEE Robotics and Automation Letters	2018–2021, 2023–2025
• IEEE Robotics and Automation Magazine	2016
• IEEE Open Journal of Control Systems	2025
• IEEE Open Journal of Signal Processing	2021
• IEEE Trans. on Aerospace and Electronic Systems	2023
• IEEE Transactions on Control Systems Technology	2017, 2019
• IEEE Transactions on Industrial Informatics	2019
• IEEE Transactions on Robotics	2013, 2015
• Marine Technology Society Journal	2017
• MDPI Sensors	2016
• Ocean Engineering	2017
• Polish Maritime Research	2021, 2023

- International Journal of Robotics Research 2018
- International Journal of System Science 2018, 2024
- Journal of Field Robotics 2023
- Journal on Intelligent & Robotic Systems 2017, 2023
- Science Robotics 2020
- Springer Scientific Reports 2025

Ad hoc Reviewer for Conferences (65+ conference papers reviewed to date):

- ASME Dynamic Systems and Control Conference (DSCC) 2018, 2019, 2020
- ASME International Conference on Ocean, Offshore & Arctic Engineering 2016
- AIAA Science and Technology Forum & Exposition (SciTech) 2015, 2018, 2020, 2024
- American Control Conference (ACC) 2014, 2015, 2019–2022
- IEEE Conference on Decision and Control (CDC) 2013, 2015, 2020
- IEEE International Conference on Robotics and Automation (ICRA) 2020–2022
- IEEE International Conference on Intelligent Robots and Systems (IROS) 2019, 2020, 2023–2025
- IEEE International Conference on Unmanned Aerial Systems (ICUAS), 2025
- IEEE Multi-Conference on Systems and Control 2013
- IEEE SoutheastCon 2024, 2025
- IFAC Conference on Control App. Marine Systems, Robotics, and Vehicles (CAMS) 2021, 2022, 2024
- IFAC Modeling, Estimation and Control Conference (MECC) 2024, 2025
- International Symposium on Distributed Autonomous Robotic Systems (DARS) 2020
- Workshop on the Algorithmic Foundations of Robotics (WAFR) 2024

Ad hoc Reviewer for Funding Agencies:

- University Research Board of the American University of Beirut, Lebanon 2023
- U.S. National Science Foundation (NSF): Division of Ocean Sciences 2019

Conference Organizing Activities:

- *UAV Competition Co-Chair* 2026
International Conference on Unmanned Aerial Systems (ICUAS), Corfu, Greece
- *Local Arrangements and Exhibits Chair, Plenary Session Chair, Program Session Co-Chair* 2025
International Conference on Unmanned Aerial Systems (ICUAS), Charlotte, NC
- *Finance Chair; Associate Editor; National Organizing Committee Member* 2024
15th IFAC Conference on Control Applications in Marine Systems, Robotics, and Vehicles, Blacksburg, VA
- *Session Co-Chair* (Trajectory and Path Planning I) 2024
AIAA Science and Technology Forum and Exposition, Orlando, FL
- *Session Co-Chair* (Remotely Operated Vehicles) 2012
MTS/IEEE OCEANS'12 Conference and Exposition, Hampton Roads, VA

Membership in Societies

- American Institute of Aeronautics and Astronautics (AIAA), Senior Member, 2007–present
- Association for Uncrewed Vehicle Systems International (AUVSI), Member, 2024–present
- International Federation of Automatic Control (IFAC), Affiliate Member, 2024–present
- Institute of Electrical and Electronics Engineers (IEEE), Senior Member, 2012–present
– Ocean Engineering Society, Member, 2020–present

- Control Systems Society, Member, 2020–present
- Robotics and Automation Society, Member, 2020–present

Media Coverage (print and digital media)

- “Kyle VanHorn is Ready for Takeoff!,” William States Lee College of Engineering News, UNC Charlotte, 2025.
- “Niner Engineers on Aeronautics Team Fly through a Milestone Year,” William States Lee College of Engineering News, UNC Charlotte, 2025.
- “Electrifying Innovation,” UNC Charlotte Magazine, Fall 2023. (BATT CAVE faculty profile article)
- “Developing (and messing about with) Robotic Autonomous Surface Vessels,” William States Lee College of Engineering News, UNC Charlotte, 2021.
- “Nonlinear Control Design for a School of Robotic Fish, A. James Clark School of Engineering News, University of Maryland, April 2020.
- “Multi-Vehicle Sensing and Control with Aerial Robots,” Maryland Robotics Center News, University of Maryland, 2019.
- “Goal Reasoning for AUV Control,” NRL Review, a publication of the Naval Research Laboratory, 2017.
- “360°: A Glider Testbed that Rolls Over,” Virginia Center for Autonomous Systems News Magazine, a publication of Virginia Tech, 2012.
- “NOVA: Making Stuff Smarter,” Public Broadcasting Service, 2011. (Featured in portion of nationally broadcast TV show.)

PROFESSIONAL DEVELOPMENT

- Graduate School Mentor Training, UNC Charlotte, 2021
- Catalyst Boot Camp, UNC Charlotte, 2021
- GKMM Summer School (on robotics, control research), Organized by Technische Universitat Darmstadt and Virginia Tech (Blacksburg, VA), 2010
- Undergraduate Research at Virginia Tech, (2006-2010)
 - Nonlinear Systems Laboratory (NSL, Dr. Craig Woolsey); Assisted with research related to the design, fabrication, and testing of a number of fixed-wing uncrewed aircraft (2007–2010)
 - Space Systems Simulation Laboratory (SSSL, Dr. Chris Hall); Assisted with research related to the Distributed Spacecraft Attitude Control System Simulator (2007)
 - Human Powered Aircraft Group (HPAG); Assisted student team with fabrication of wing spars and ribs for aircraft to compete in the Kremer Prize (2006)

HONORS AND AWARDS

Senior Member, Institute of Electrical and Electronics Engineers (IEEE)	2024
Senior Member, American Institute for Aeronautics and Astronautics (AIAA)	2024
Air Force Office of Scientific Research (AFOSR) Summer Faculty Fellowship Program (SFFP) Award based on competitive proposal submission to collaborate during the summer of 2023 at Wright-Patterson AFB with Dr. David Casbeer and research team at AFRL-Aerospace Systems Directorate.	2023
A. James Clark Student Competition Advisor Award, University of Maryland Awarded to one group annually for leadership of engineering student design competition teams. I received this award (along with Dr. Derek Paley) for leading the UMD Autonomous Micro-Air Vehicle (AMAV) Team.	2021
Alan Berman Research Publication Award, U.S. Naval Research Laboratory Recognizes the best publications from each Division within NRL, awarded for M. A. Wilson et al. <i>AI Comm.</i> , 2018.	2019

Maryland Robotics Center (MRC) Postdoctoral Fellowship, University of Maryland, College Park Fellowship awarded to approximately five individuals per year.	2018
The Naval Research Laboratory (NRL) Postdoctoral Fellowship Program Fellowship administered by American Society For Engineering Education (ASEE) and awarded to approximately forty individuals nation-wide per year on the basis of overall qualifications and technical proposals.	2015–2018
Pratt Fellowship, College of Engineering, Virginia Tech Merit-based scholarship awarded to select students in the College of Engineering.	2012
Eleanor Davenport Fellowship, College of Engineering, Virginia Tech Merit-based scholarship awarded to select students in the College of Engineering.	2011
Best Student Paper Award, 69th Annual Conference of The Society of Allied Weight Engineers For the joint publication L. Butt et al. “Wing morphing design utilizing macro-fiber composite smart materials”.	2010
Dean’s List, Virginia Tech Awarded by the College of Engineering to undergraduate students that maintain a high grade point average.	2006–2010