

NICOLA BEZZO

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Academic Positions

- **Associate Professor (research focus: Mobile Robot Motion Planning and Control)** — 08/2022–present
Systems Engineering (Primary), Electrical and Computer Engineering (Secondary), Computer Science (Courtesy), University of Virginia, Charlottesville, VA USA.
- **Assistant Professor (research focus: Mobile Robot Motion Planning and Control)** — 01/2016–08/2022
Systems Engineering (Primary), Electrical and Computer Engineering (Secondary), Computer Science (Courtesy), University of Virginia, Charlottesville, VA USA.
- **Postdoctoral Researcher (research focus: Resilient, Assured Autonomy, Rapid Prototyping and Co-design)** — 11/2012–12/2015
Computer Science, University of Pennsylvania, Philadelphia, PA, USA.
- **Research Assistant in Electrical and Computer Engineering (research focus: Multi-Robot Systems)** — 08/2008–10/2012
Electrical and Computer Engineering, University of New Mexico, Albuquerque, NM, USA.
- **Research Assistant in Electrical Engineering (research focus: Automation & Electrical Measurements)** — 09/2007–07/2008
Electrical Engineering, Politecnico di Milano, Milan, ITALY.

Education

- **Postdoc in Computer Science (Robotics & CPS)** — 11/2012-12/2015
University of Pennsylvania, Philadelphia, PA, USA (Supervisor: Prof. Insup Lee).
- **Ph.D. in Electrical and Computer Engineering (Robotics & Control Systems)** — 08/2008-10/2012
University of New Mexico, Albuquerque, NM, USA (Thesis Advisor: Prof. Rafael Fierro).
- **Master of Science in Electrical Engineering** — 08/2006-07/2008
Politecnico di Milano, Milan, ITALY (Thesis Advisor: Prof. Roberto Ottoboni).
 - Degree with honor (summa cum laude).
- **Exchange Student 1st year of Master in Electrical Engineering** — 08/2006-08/2007
Oklahoma State University, Stillwater, OK, USA.
 - GPA: 3.9/4.0.
- **Bachelor of Science in Electrical Engineering** — 09/2003-07/2006
Politecnico di Milano, Milan, ITALY (Thesis Advisor: Prof. Roberto Ottoboni).
 - Degree with honor (summa cum laude).

Honors & Awards

- Recipient of the 2023 UVA Outstanding Researcher Award (2024).
- Elevation to IEEE Senior Member (2023).
- Finalist NIST First Responder UAS 3D Mapping Challenge (2023).

- Recipient of the IEEE Systems & Information Design Symposium (SIEDS) "Best Paper Award" (2023, 2018).
- Recipient of the 2022 Amazon Faculty Research Award (2022).
- Recipient of the 2022 UVA Mead Endowment - Henry Kinnier Award (2022).
- 2nd Place at the International Conference on Robotics and Automation BARN Challenge (2022).
- Recipient of the IEEE Robotics & Automation Magazine (RAM) "Best Paper Award" (2016).
- Recipient of two DARPA HACMS outstanding service awards (2015, 2013).
- Recipient of the ACM/IEEE International Conference on Cyber Physical Systems (ICCPs), CPSWeek "Best Paper Award" (2014).
- Recipient of the "Outstanding Student Service Award" from the University of New Mexico (2011).
- Awarded the Gold Medal from the Politecnico School of Engineering, for best graduate student in Electrical Engineering (2010).
- N° 2 degrees with honor (summa cum laude) from Politecnico di Milano (2008, 2006).
- Recipient of the "President Honor Roll for Outstanding Academic Performance" from Oklahoma State University (2007).
- Ranked 11th among 30.000 applicants at Politecnico di Milano Entrance Exam (2003).

Student Advisee Awards

- Link Lab Distinguished Research Award (2024) - Lauren Bramblett (SIE PhD'24)
- Outstanding Graduate Student Award (2024) - Lauren Bramblett (SIE PhD'24)
- Best Graduate Student Award (2021) – Esen Yel (SIE PhD'21)
- RSS Pioneer Award (2021) – Esen Yel (SIE PhD'21)
- NSF NRT Fellowship (2021) – Noelle Law (ECE BS'20)
- NSF NRT Fellowship (2021) – William Clark (SIE MS'23)
- Link Lab Student Seminar Award for outstanding research (2020) - Esen Yel (SIE PhD'21)
- 1st place National Collegiate Cyber Defense Competition (CCDC'20) - Maggie Gates (CS MS'20)
- NSF NRT Fellowship (2020) - Jacob Higgins, Electrical Engineering (ECE PhD'24)
- Ruthie Oxford Memorial Award for most promising graduate student (2018) – Esen Yel (SIE PhD'21)
- 2nd place UVA ECE Welcome back Research Poster Award (2018) – Shijie Gao (ECE PhD'24)
- 2nd place UVA ECE Student Research Poster Award (2017) – Atiena Branch (ECE BS'18)

Research Interests

- Robotics, Assured Autonomy, Motion and Task Planning, Control, Sim-to-Real, Runtime Monitoring, Reachability Analysis, Unmanned Aerial and Ground Vehicles Applications, Multi-robot and Heterogeneous Systems, Human-robot interaction, Epistemic Planning, CPS Cyber-security

Publications

- **Peer reviewed Journals:**
 - L. Bramblett, **N. Bezzo**. *Epistemic Planning for Multi-Robot Systems in Communication Restricted Environments*. In *Frontiers in Robotics and AI*, 2023 (Special Issue) – Impact = 3.4

- Xuesu Xiao, Zifan Xu, Zizhao Wang, Yunlong Song, Garrett Warnell, Peter Stone, Tingnan Zhang, Shravan Ravi, Gary Wang, Haresh Karnan, Joydeep Biswas, Nicholas Mohammad, Lauren Bramblett, Rahul Peddi, Nicola Bezzo, Zhanteng Xie, Philip Dames. *Autonomous Ground Navigation in Highly Constrained Spaces: Lessons Learned From the Benchmark Autonomous Robot Navigation Challenge at ICRA 2022*. In IEEE Robotics and Automation Magazine (RAM), 2022 – Impact = 5.22
- S. Gao, E. Yel, N. Bezzo. *Meta-Learning-based Proactive Online Planning for UAVs under Degraded Conditions*. In IEEE Robotics and Automation Letters (RA-L), 2022 – Impact = 4.3
- R. Peddi, N. Bezzo. *An Interpretable Decision Tree-based Virtual Physics Method for Non-interfering Social Planning*. In IEEE Robotics and Automation Letters (RA-L), 2022 – Impact = 4.3
- P. Bonczek, R. Peddi, S. Gao, N. Bezzo. *Detection of Non-random Sign-based Behavior for Resilient Coordination of Robotic Swarms*. In 2022 Transactions on Robotics (TRO) – Impact = 7
- J. Higgins, N. Bezzo, *Negotiating Visibility for Safe Autonomous Navigation in Occluding and Uncertain Environments*. In IEEE Robotics and Automation Letters (RA-L), 2021 – Impact = 4.3
- C. Di Franco, N. Bezzo, *Interpretable Run-time Monitoring and Replanning for Safe Autonomous Systems Operations*. In IEEE Robotics and Automation Letters (RA-L), 2020 – Impact = 4.3
- E. Yel, N. Bezzo, *Computation-Aware Adaptive Planning and Scheduling for Safe Unmanned Airborne Operations*. In Journal of Intelligent and Robotic Systems (JINT), 2020 – Impact = 3.0
- E. Yel, T. Carpenter, R. Ivanov, C. Di Franco, J. Weimer, I. Lee, N. Bezzo, *Assured Run-time Monitoring and Planning: Towards Verification of Deep Neural Networks for Safe Autonomous Operations*. In IEEE Robotics and Automation Magazine (RAM), 2020 – Impact = 5.22
- M. Pajic, J. Weimer, N. Bezzo, O. Sokolsky, G. J. Pappas, I. Lee, *Design and Implementation of Attack-Resilient Cyber-Physical Systems*. In IEEE Control Systems Magazine (CSM),. vol. 37, issue 2, pp. 66-81, 2017 – Impact = 6
- N. Bezzo, A. Mehta, C. D. Onal, M. T. Tolley, *Robot Makers: The Future of Digital Rapid Design and Fabrication of Robots*. In IEEE Robotics and Automation Magazine (RAM), vol. 22, pp. 27-36, 2015. (Best Paper Award) – Impact = 5.33
- N. Bezzo, P. Cruz, F. Sorrentino, and R. Fierro, *Decentralized identification and control of networks of coupled mobile platforms through adaptive synchronization of chaos*. In Elsevier Physica D, vol. 267, pp. 94-103, 2014 – Impact = 3.08
- N. Bezzo, B. Griffin, P. Cruz, J. Donahue, R. Fierro, and J. Wood, *A Cooperative Heterogeneous Mobile Wireless Mechatronic System*. In IEEE/ASME Transactions on Mechatronics (TMech), vol. 19, no. 1, pp. 20-31, 2014 – Impact = 5.33
- N. Bezzo, R. Fierro, A. Swingler, and S. Ferrari, *A Disjunctive Programming Approach for Motion Planning of Mobile Router Networks*. In International Journal of Robotics and Automation (Special Issue), vol. 26, no. 1, pp. 13-25, 2011 – Impact = 1.5

- **Peer reviewed Journals under Review:**

- S. Gao, N. Bezzo. *A Schwarz-Christoffel Mapping-based Framework for Sim-to-Real Transfer in Autonomous Robot Operations*. In Springer Journal of Journal of Intelligent & Robotic Systems (JINT), 2024
- R. Peddi, N. Bezzo. *Model Predictive Control-based Attention-aware Robot Social Planning*. In IEEE Robotics and Automation Letters (RA-L), 2024

- **Peer reviewed Conferences:**

- P. Sherman, N. Bezzo. *Heterogeneous System of Systems for Proactive Path Planning in Uncertain Environments*. In IEEE International Conference on Intelligent Robots and Systems (IROS), 2024 (to appear)
- L. Bramblett, B. Miloradovic, P. Sherman, A. V. Papadopoulos, N. Bezzo. *Robust Online Epistemic Replanning of Multi-Robot Missions*. In IEEE International Conference on Intelligent Robots and Systems (IROS), 2024 (to appear)

- P. Bonczek, **N. Bezzo**, *A Cooperative Recovery Framework for Resilient Multi-Robot Swarm Operations under Loss of Localization in Unknown Environments*. In IEEE International Conference on Intelligent Robots and Systems (IROS), 2024 (to appear)
- N. Mohammad, J. Higgins, **N. Bezzo**, *A GP-based Robust Motion Planning Framework for Agile Autonomous Robot Navigation and Recovery in Unknown Environments*. In IEEE International Conference on Robotics and Automation (ICRA), Yokohama, Japan, May 13-17, 2024 – Acceptance Rate = 44%
- R. Peddi, **N. Bezzo**, *A Decision Tree-based Monitoring and Recovery Framework for Autonomous Robots with Decision Uncertainties*. In IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), Detroit, MI, USA, October 1 - 5, 2023 – Acceptance Rate = 43%
- L. Bramblett, **N. Bezzo**, *Epistemic Planning for Heterogeneous Robotic Systems*. In IEE/RSJ International Conference on Intelligent Robots and Systems (IROS), Detroit, MI, USA, October 1 - 5, 2023 – Acceptance Rate = 43%
- J. Higgins, N. Mohammad, **N. Bezzo**, *A Model Predictive Path Integral Method for Fast, Proactive, and Uncertainty-Aware UAV Planning in Cluttered Environments*. In IEE/RSJ International Conference on Intelligent Robots and Systems (IROS), Detroit, MI, USA, October 1 - 5, 2023 – Acceptance Rate = 43%
- P. Bonczek, **N. Bezzo**, *RSSI-based Localization with Adaptive Noise Covariance Estimation for Resilient Multi-Agent Formations*. In IEEE American Control Conference (ACC), San Diego, CA, USA, May 31 - June 02, 2023 – Acceptance Rate = 50%.
- L. Bramblett, S. Gao, **N. Bezzo**, *Epistemic Prediction and Planning with Implicit Coordination for Multi-Robot Teams in Communication Restricted Environments*. In IEEE International Conference on Robotics and Automation (ICRA), London, UK, May 29 - June 2, 2023 – Acceptance Rate = 45%.
- E. Bini, A. Papadopoulos, J. Higgins, **N. Bezzo**, *Optimal Reference Tracking for Sampled-Data Control Systems*. In IEEE Conference on Decision and Control (CDC), Cancun, Mexico, December 6 - 9, 2022 – Acceptance Rate = 50%.
- L. Bramblett, R. Peddi, **N. Bezzo**, *Coordinated Multi-Agent Exploration & Exploitation of Unknown Environments with Limited Connectivity*. IEE/RSJ International Conference on Intelligent Robots and Systems (IROS), Kyoto, Japan, October 23 - 27, 2022 – Acceptance Rate = 45% .
- N. Mohammad, **N. Bezzo**, *A Robust and Fast Occlusion-based Frontier Method for Autonomous Navigation in Unknown Cluttered Environments*. IEE/RSJ International Conference on Intelligent Robots and Systems (IROS), Kyoto, Japan, October 23 - 27, 2022 – Acceptance Rate = 45%.
- P. Bonczek, **N. Bezzo**, *Resilient Detection and Recovery of Autonomous Systems Operating under on-board Controller Cyber Attacks*. IEE/RSJ International Conference on Intelligent Robots and Systems (IROS), Kyoto, Japan, October 23 - 27, 2022 – Acceptance Rate = 45%.
- M. Cleveland, Esen Yel, Y. Kantaros, I. Lee, **N. Bezzo**, *Learning Enabled Fast Planning and Control in Dynamic Environments with Intermittent Information*. IEE/RSJ International Conference on Intelligent Robots and Systems (IROS), Kyoto, Japan, October 23 - 27, 2022 – Acceptance Rate = 45%.
- J. Higgins, E. Bini, **N. Bezzo**, *Offloaded Receding Horizon Planning for Environments with Variable Communication Delays*. IEEE Conference on Control Technology and Applications (CCTA), Trieste, Italy, August 22 - 25, 2022 – Acceptance Rate = 50%.
- J. Higgins, **N. Bezzo**, *A Model Predictive-based Motion Planning Method for Safe and Agile Traversal of Unknown and Occluding Environments*. In IEEE International Conference on Robotics and Automation (ICRA), Philadelphia, PA, May 23 - 27, 2022 – Acceptance Rate = 45%.
- C. Gall, **N. Bezzo**, *Gaussian Process-based Interpretable Runtime Adaptation for Safe Autonomous Systems Operations in Unstructured Environments*. In IEEE International Conference on Intelligent Robots and Systems (IROS), Prague, Czech Republic, Sept 27 - Oct. 1, 2021 – Acceptance Rate = 45%.
- S. Gao, **N. Bezzo**, *A Conformal Mapping-based Framework for Robot-to-Robot and Sim-to-Real Transfer Learning*. In IEEE International Conference on Intelligent Robots and Systems (IROS), Prague, Czech Republic, Sept 27 - Oct. 1, 2021 – Acceptance Rate = 45%.

- E. Yel, **N. Bezzo**, *A Meta-Learning-based Trajectory Tracking Framework for UAVs under Degraded Conditions*. In IEEE International Conference on Intelligent Robots and Systems (IROS), Prague, Czech Republic, Sept 27 - Oct. 1, 2021 – Acceptance Rate = 45%.
- R. Peddi, **N. Bezzo**, *Interpretable Run-Time Prediction and Planning in Co-Robotic Environments*. In IEEE International Conference on Intelligent Robots and Systems (IROS), Prague, Czech Republic, Sept 27 - Oct. 1, 2021 – Acceptance Rate = 45%.
- P. Bonczek, **N. Bezzo**, *Detection and Inference of Non-random Behavior for Resilient Multi-vehicle Coordinated Operations*. In IEEE International Conference on Intelligent Robots and Systems (IROS), Prague, Czech Republic, Sept 27 - Oct. 1, 2021 – Acceptance Rate = 45%.
- J. Higgins, **N. Bezzo**, *Negotiating Visibility for Safe Autonomous Navigation in Occluding and Uncertain Environments*. In IEEE International Conference on Robotics and Automation (ICRA), Xi'An, China, May 30 - Jun. 5, 2021 – Acceptance Rate = 40%.
- P. Bonczek, **N. Bezzo**, *Detection of Hidden Attacks on Cyber-Physical Systems from Serial Magnitude and Sign Randomness Inconsistencies*. In IEEE American Control Conference (ACC), New Orleans, May 26 - 28, 2021 – Acceptance Rate = 50%.
- E. Yel, **N. Bezzo**, *GP-based Runtime Planning, Learning, and Recovery for Safe UAV Operations under Unforeseen Disturbances*. In IEEE International Conference on Intelligent Robots and Systems (IROS), Las Vegas, NV, Oct. 25 - 29, 2020 – Acceptance Rate = 45%.
- R. Peddi, C. Di Franco, S. Gao, **N. Bezzo**, *A Data-driven Framework for Proactive Intention-Aware Motion Planning of a Robot in a Human Environment*. In IEEE International Conference on Intelligent Robots and Systems (IROS), Las Vegas, NV, Oct. 25 - 29, 2020 – Acceptance Rate = 45%.
- C. Hilderbrandt, S. Elbaum, **N. Bezzo**, MB. Dwyer, *A Feasible and stressful trajectory generation for mobile robots*. In 29th ACM SIGSOFT International Symposium on Software Testing and Analysis (ISSTA), Los Angeles, CA, Jul. 18 - 22, 2020 – Acceptance Rate = 15%.
- C. Di Franco, **N. Bezzo**, *Interpretable Run-time Monitoring and Replanning for Safe Autonomous Systems Operations*. In IEEE International Conference on Robotics and Automation (ICRA), 2020 – Acceptance Rate = 40%.
- C. Hilderbrandt, S. Elbaum, **N. Bezzo**, *Blending Kinematic and Software Models for Tighter Reachability Analysis*. In International Conference on Software Engineering (ICSE), 2020 – Acceptance Rate = 15%.
- P. Bonczek, **N. Bezzo**, *Model-based Randomness Monitor for Stealthy Sensor Attacks*. In 2020 American Control Conference (ACC) – Acceptance Rate = 60%
- P. Bonczek, **N. Bezzo**, *Memoryless Cumulative Sign Detector for Stealthy CPS Sensor Attacks* In 2020 International Federation of Automatic Control (IFAC) – Acceptance Rate = 50%
- E. Yel, **N. Bezzo**, *Fast Run-time Monitoring, Replanning, and Recovery for Safe Autonomous System Operations*. In IEEE International Conference on Intelligent Robots and Systems (IROS), Macau, China, Nov. 4 - 8, 2019 – Acceptance Rate = 45%.
- R. Peddi, **N. Bezzo**, *Parameter-free Regression-based Autonomous Control of Off-the-shelf Quadrotor UAVs*. In IEEE International Conference on Unmanned Aerial Systems (ICUAS), Atlanta, GA, June 11 - 14, 2019 – Acceptance Rate = 60%.
- S. Gao, C. Di Franco, D. Carter, D. Quinn, **N. Bezzo**, *Exploiting Ground and Ceiling Effects on Autonomous UAV Motion Planning*. In IEEE International Conference on Unmanned Aerial Systems (ICUAS), Atlanta, GA, June 11 - 14, 2019 – Acceptance Rate = 60%.
- Z. Vatansever, M. Brandt-Pearce, **N. Bezzo**, *Localization in Optical Wireless Sensor Networks for IoT Applications*. In IEEE International Conference on Communications (ICC) May 20, 2019.
- E. Yel, T. Lin, **N. Bezzo**, *Self-triggered Adaptive Planning and Scheduling of UAV Operations*. In 2018 IEEE International Conference on Robotics and Automation (ICRA), Brisbane, Australia, May 21-25 2018, pp. 7518-7524 – Acceptance Rate = 40%.
- T. Lin, **N. Bezzo**, *Energy-aware Persistent Control of Heterogeneous Robotic Systems*. In 2018 American Control Conference (ACC), Milwaukee, WI, June 27-29 2018, pp. 2782-2787 – Acceptance Rate = 50%.

- M. Elnaggar, N. **Bezzo**. *An IRL Approach for Cyber-Physical Attack Intention Prediction and Recovery*. In 2018 American Control Conference (ACC), Milwaukee, WI, June 27-29 2018, pp. 222-227 – Acceptance Rate = 50%.
- E. Yel, T. Lin, N. **Bezzo**. *Reachability-based self-triggered scheduling and replanning of UAV operations*. In 2017 IEEE NASA/ESA Conference of Adaptive Hardware and Systems (AHS), Pasadena, CA, July 24-27 2017, pp. 221-228 – Acceptance Rate = 55%.
- M. Elnaggar, J. D. Hiser, T. Lin, A. Nguyen-Tuong, M. Co, J. W. Davidson, N. **Bezzo**. *Online control adaptation for safe and secure autonomous vehicle operations*. In 2017 NASA/ESA Conference of Adaptive Hardware and Systems (AHS), Pasadena, CA, July 24-27 2017, pp.101-108 – Acceptance Rate = 55%.
- E. Yel, T. Lin, N. **Bezzo**. *Reachability-based self-triggered UAV motion planning*. In 2017 International Symposium on Aerial Robotics, June 19-20 2017 – Acceptance Rate Unknown.
- N. **Bezzo**, K. Mohta, C. Nowzari, I. Lee, V. Kumar, G. Pappas, *Online Planning for Energy-efficient and Disturbance-aware UAV Operations*. In IEEE International Conference on Intelligent Robots and Systems (IROS), Daejeon, South Korea, October 9-14, 2016, pp. 5027-5033 – Acceptance Rate = 45%.
- N. **Bezzo**, J. Weimer, Y. Du, O. Sokolsky, S. H. Son, I. Lee, *A Stochastic Approach for Attack Resilient UAV Motion Planning*. In 2016 American Control Conference (ACC 2016), Boston (MA), July 6-8, 2016, pp. 1366-1372 – Acceptance Rate = 50%.
- Y. Shoukry, P. Nuzzo, N. **Bezzo**, A. L. Sangiovanni-Vincentelli, S. A. Seshia, P. Tabuada, *Secure State Reconstruction in Differentially Flat Systems Under Sensor Attacks Using Satisfiability Modulo Theory Solving*. In IEEE Control and Decision Conference (CDC), Osaka, Japan, Dec. 15 - 18, 2015, pp. 3804-3809 – Acceptance Rate = 56%.
- N. **Bezzo**, M. Piccoli, P. Gebhard, V. Kumar, M. Yim, I. Lee, *Rapid Co-design of electro-mechanical specifications for robotic systems*. In ASME 2015 International Design Engineering Technical Conferences & Computers and Information in Engineering Conference (IDETC/CIE 2015), Boston, MA, Aug. 2 - 5, 2015 – Acceptance Rate = 60%.
- N. **Bezzo**, J. Weimer, M. Pajic, O. Sokolsky, G. J. Pappas, I. Lee, *Attack Resilient State Estimation for Autonomous Robotic Systems*. In IEEE International Conference on Intelligent Robots and Systems (IROS), Chicago, IL, Sept. 14 - 18, 2014, pp. 3692-3698 – Acceptance Rate = 46%.
- J. Weimer, O. Sokolsky, N. **Bezzo**, and I. Lee, *Towards Assurance Cases for Resilient Control Systems*. In IEEE International Conference on Cyber-Physical Systems, Networks, and Application (CPSNA), Hong Kong, China, August 25 - 26, 2014, pp. 1-6. (*Invited Paper*) – Acceptance Rate Unknown.
- A. Mehta, N. **Bezzo**, P. Gebhard, B. An, V. Kumar, I. Lee, and D. Rus, *A Design Environment for the Rapid Specification and Fabrication of Printable Robots*. In International Symposium on Experimental Robotics (ISER), Marrakech/Essaouira, Morocco, June 15 - 18, 2014 – Acceptance Rate Unknown.
- M. Pajic, J. Weimer, N. **Bezzo**, P. Tabuada, O. Sokolsky, I. Lee, and G. J. Pappas, *Robustness of Attack-resilient State Estimators*. In ACM/IEEE International Conference on Cyber-Physical Systems (ICCPS), Berlin, Germany, April 14 - 17, 2014, pp. 163-174 (**Best Paper Award**) – Acceptance Rate = 25%.
- J. Weimer, N. **Bezzo**, M. Pajic, O. Sokolsky, and I. Lee, *Attack-Resilient Minimum Mean-Squared Error Estimation*. In 2014 American Control Conference (ACC 2014), Portland (OR), June 4-6, 2014, pp. 1366-1372 – Acceptance Rate = 50%.
- N. **Bezzo**, F. Sorrentino, and R. Fierro, *Decentralized Estimation of Topology Changes in Wireless Robotic Networks*. In American Control Conference (ACC), Washington D.C., June 17-19, 2013, pp. 5899-5904 – Acceptance Rate = 50%.
- N. **Bezzo**, M. Anderson, and R. Fierro, *A Real World Coordination Framework for Connected Heterogeneous Robotic Systems*. International Symposium on Distributed Autonomous Robotic Systems (DARS), Baltimore, MD, November 8-11, 2012 – Acceptance Rate = 40%.

- N. Bezzo, and R. Fierro, *Decentralized Connectivity and User Localization Via Wireless Robotic Networks*. In IEEE Global Communications Conference (GLOBECOM), Wi-UAV, Houston, TX, December 5, 2011, pp. 1285-1290 – Acceptance Rate = 36%.
 - N. Bezzo, Y. Yuan, R. Fierro, and Y. Mostofi, *A Decentralized Connectivity Strategy for Mobile Router Swarms*. In the 18th World Congress of the International Federation of Automatic Control (IFAC), Milan, Italy, August 30, 2011 – Acceptance Rate = 55%.
 - N. Bezzo, and R. Fierro, *Swarming of Mobile Router Networks*. In American Control Conference (ACC), San Francisco, CA, July 1, 2011, pp. 4685-4690 – Acceptance Rate = 60%.
 - N. Bezzo, and R. Fierro, *Tethering of Mobile Router Networks*. In American Control Conference (ACC), Baltimore, MD, June 30, 2010, pp. 6828-6833 – Acceptance Rate = 60%.
- **Peer reviewed Conferences under Review:**
 - S. Gao, L. Bramblett, N. Bezzo. *Take Your Best Shot: Sampling-Based Next-Best-View Planning for Autonomous Photography & Inspection*. In IEEE International Conference on Intelligent Robots and Systems (IROS), 2024
- **Book Chapters:**
 - A. Mehta, N. Bezzo, P. Gebhard, B. An, V. Kumar, I. Lee, and D. Rus, *A Design Environment for the Rapid Specification and Fabrication of Printable Robots*. Book Chapter in Springer STAR series in Robotics, 2015.
 - N. Bezzo, and R. Fierro, *A Real World Coordination Framework for Connected Heterogeneous Robotic Systems*. Book Chapter in "Distributed Autonomous Robotic Systems", Springer STAR series in Robotics, vol. 104, pp.75-89, 2014.
 - N. Bezzo, R. A. Cortez, and R. Fierro, *Exploiting Heterogeneity in Robotic Networks*. Book Chapter in Springer "Redundancy in Robot Manipulators and Multi-Robot Systems" vol. 57, pp. 53-75, 2013.
- **Miscellaneous Other Conferences:**
 - V. Shah, M. Heeter, J. Vallarino, P. Sherman, L. Bramblett, N. Bezzo, *Evolutionary-based Coordination of Multi-Robot Systems with Dynamic Constraints*. In IEEE Systems and Information Engineering Design Symposium (SIEDS), pp. 7-12, 2024 (**Best Paper Award**).
 - S. Nayhouse, S. Chadha, P. Hourican, C. Moore, N. Bezzo, *A General Framework for Human-Drone Interaction under Limited On-board Sensing*. In IEEE Systems and Information Engineering Design Symposium (SIEDS), pp. 308-313, 2023 (**Best Paper Award**).
 - G. Glaubit, K. Kleeman, N. Law, J. Thomas, S. Gao, R. Peddi, E. Yel, N. Bezzo, *Fast, Safe, and Proactive Runtime Planning and Control of Autonomous Ground Vehicles in Changing Environments* In IEEE Systems and Information Engineering Design Symposium (SIEDS), pp. 1-6, 2021
 - S. Wang, N. Anselmo, M. Garrett, R. Remias, M. Trivett, A. Christoffersen, N. Bezzo, *Fly-Crash-Recover: A Sensor-based Reactive Framework for Online Collision Recovery of UAVs* In IEEE Systems and Information Engineering Design Symposium (SIEDS), pp. 1-6, 2020
 - J. Benko, W. Clark, C. Craig, G. Culver, P. Mahan, A. Patel, D. Voce, N. Bezzo, G. Lewin. *Security and Resiliency of Coordinated Autonomous Vehicles*. In IEEE Systems and Information Engineering Design Symposium (SIEDS), pp. 1-6, 2019.
 - H. Finegan, S. Jaffe, A. Leon, K. Lytle, E. Morgan, C. Greene, A. Meyer, B. Brinkman, S. De Wekker, H. Yochum, N. Bezzo. *Development of an Autonomous Agricultural Vehicle to Measure Soil Respiration*. In Systems and Information Engineering Design Symposium (SIEDS), pp. 1-6. 2019.
 - V. Marquis, R. Ho, W. Rainey, M. Kimpel, J. Ghiorzi, W. Cricchi, N. Bezzo, *Toward attack-resilient state estimation and control of autonomous cyber-physical systems*. In IEEE Systems and Information Engineering Design Symposium (SIEDS), pp. 70-75, 2018 (**Best Paper Award**).

- R. D. Rosenfeld, M. G. Restrepo, W. H. Gerard, W. E. Bruce, A. A. Branch, G. C. Lewin, N. Bezzo, *Unsupervised surface classification to enhance the control performance of a UGV*. In IEEE Systems and Information Engineering Design Symposium (SIEDS), pp. 225-230, 2018.
- C.A. Wolf, R.P. Hardis, S.D. Woodrum, R.S. Galan, H.S. Wichelt, M.C. Metzger, N. Bezzo, G. C. Lewin, S.F.J. de Wekker, *Wind data collection techniques on a multi-rotor platform*. In IEEE Systems and Information Engineering Design Symposium (SIEDS), pp. 32-37, 2017.
- Z. Calhoun, P. Maribojoc, N. Selzer, L. Procopi, N. Bezzo, C. Fleming, *Analysis of Identity and Access Management alternatives for a multinational information-sharing environment*. In IEEE Systems and Information Engineering Design Symposium (SIEDS), pp. 208-213, 2017.
- M. Pajic, N. Bezzo, I. Lee, *Design and Implementation of Attack-Resilient Cyber-Physical Systems*, In High-Confidence Software and Systems Conference (HCSS), Annapolis, MD, May 2016.
- N. Bezzo, K. Mohta, V. Kumar, I. Lee, *A Run time Monitoring Framework for Safe Coordination of Unmanned Aerial Vehicles* In Safe and Secure Systems and Software Symposium (S5) , Dayton, OH, 10 June 2015

- **Workshops:**

- S. Gao, L. Bramblett, N. Bezzo. *Next-Best-View-based Task and Motion Planning for Autonomous Photography & Inspection*. In 2023 Workshop on Task and Motion Planning: from Theory to Practice within IEEE International Conference on Intelligent Robots and Systems (IROS), Detroit, MI, October 1-5 2023.
- E. Yel, N. Bezzo. *Reachability-based Adaptive UAV Scheduling and Planning in Cluttered and Dynamic Environments*. In 2018 Workshop on Informative Path Planning and Adaptive Sampling within IEEE International Conference on Robotics and Automation (ICRA), Brisbane, Australia, May 21-25 2018.
- N. Bezzo, Y. Du, O. Sokolsky, and I. Lee, *A Markovian Approach for Attack Resilient Control of Mobile Robotic Systems*. In Second International Workshop on Robotic Sensor Networks (RSN), Seattle, Washington, April 13, 2015.
- O. Sokolsky, M. Pajic, N. Bezzo, and I. Lee, *Architecture-Centric Software Development for Cyber-Physical Systems*. In First Workshop on Cyber-Physical System Architectures and Design Methodologies (CPSArch), New Delhi, India, October 17, 2014.
- L. Feng, A. L. King, S. Chen, A. Ayoub, J. Park, N. Bezzo, O. Sokolsky, and I. Lee *A Safety Argument Strategy for PCA Closed-Loop Systems: A Preliminary Proposal*. In Medical Cyber Physical Systems Workshop (MedicalCPS), Berlin, Germany, April 14, 2014.
- J. Weimer, N. Bezzo, M. Pajic, G. J. Pappas, O. Sokolsky, and I. Lee, *Resilient Parameter-Invariant Control with Application to Vehicle Cruise Control*. In Workshop on Control of Cyber-Physical Systems, Johns Hopkins University, Baltimore, MD, March 2013.
- N. Bezzo, and R. Fierro, *Mobile Robotic Routers Networks*. In Workshop on Frontiers of Real-World Multi-Robot Systems: Challenges and Opportunities, Duke University, Durham, NC, October 10-11, 2011
- N. Bezzo, P. Cruz, I. Palunko, T. Appel, D. Galarowicz, and R. Fierro, *The MARHES heterogeneous multi robot test bed* . In 1st Southwest Workshop on Cyber-Physical Systems, University of Arizona, Tucson, AZ, March 10-11 2011.

- **Demos and Abstracts:**

- N. Bezzo, J. Park, A. King, P. Gebhard, R. Ivanov, I. Lee, *Demo Abstract: ROSLab – A Modular Programming Environment for Robotic Applications*. Demonstration at the 5th ACM/IEEE International Conference on Cyber-Physical Systems (ICCPS, CPSWEEK 2014), Berlin, Germany, April 2014, pp. 214-214.
- M. Pajic, N. Bezzo, J. Weimer, O. Sokolsky, N. Michael, G. J. Pappas, P. Tabuada, and I. Lee, *Demo Abstract: Synthesis of Platform-aware Attack-Resilient Vehicular Systems*. Demonstration at the 4th ACM/IEEE International Conference on Cyber-Physical Systems (ICCPS, CPSWEEK 2013), Philadelphia, Pennsylvania, April 2013, pp. 251-251.

- M. Pajic, N. **Bezzo**, J. Weimer, R. Alur, R. Mangharam, N. Michael, G. J. Pappas, P. Tabuada, and I. Lee, *Towards synthesis of platform-aware attack-resilient control systems*. Work-in-Progress Abstract at the 4th ACM/IEEE International Conference on Cyber-Physical Systems (ICCPs, CPSWEEK 2013), Philadelphia, Pennsylvania, April 2013.

- **Posters:**

- S. Gao, L. Bramblett, N. **Bezzo** *Next-Best-View-based Task and Motion Planning for Autonomous Photography & Inspection*. International Conference on Intelligent Robots and Systems, Detroit, October 1 2021.
- J. Higgins, N. **Bezzo** *Negotiating Visibility for Safe Autonomous Navigation in Occluding and Uncertain Environments*. University of Virginia Research Symposium, UVA, April 8 2021.
- P. Bonczek, N. **Bezzo** *Cumulative Sign Detector for Stealthy Attacks on Mobile Robotic Swarms*. University of Virginia Research Symposium, UVA, April 7 2020.
- S. Gao, C. Di Franco, N. **Bezzo** *Exploiting Ground and Ceiling Effects on Autonomous UAV Motion Planning*. ECE Welcome back Research Poster Award, UVA, September 4 2018 (**Best poster award**).
- E. Yel, N. **Bezzo** *Reachability-based Self-triggered Scheduling and Replanning of UAV Operations*. Student Research Poster Session, UVA, August 21 2017.
- A. Branch, H. Dean, N. **Bezzo** *Toward Assisted Robotics Perimeter & Surface Mapping*. Student Research Poster Session, UVA, August 21 2017 (**Best poster award**).
- V. Saraiya, N. **Bezzo** *Toward Disturbance Rejection Control of Autonomous Aerial Vehicles*. Student Research Poster Session, UVA, August 21 2017.

- **Theses and Technical Reports**

- G. Moore, N. **Bezzo** *Proactive and Attentive Autonomous Navigation and Avoidance of Dynamic and Intermittently-Visible Actors*. MS Thesis, December 2023
- W. Clark, N. **Bezzo** *Hamiltonian Monte Carlo-Based Risk-Aware Motion Planning of Autonomous Robots Subject to Uncertainty*. MS Thesis, May 2023
- R. Peddi, N. **Bezzo** *Interpretable Monitoring for Self and Socially Aware Mobile Robot Planning*. PhD Thesis, December 2022
- P. Bonczek, N. **Bezzo** *Randomness-Based Behavior Monitoring for Resilient Autonomous Robot Operations*. PhD Thesis, December 2022
- N. Mohammad, N. **Bezzo** *Occlusion-Aware Motion Planning of Autonomous Robots in Cluttered and Unknown Environments*. PhD Thesis, May 2022
- E. Yel, N. **Bezzo** *Online Predictive Monitoring and Proactive Planning for Safe Autonomous Robot Operations*. PhD Thesis, July 2021
- P. Seaton, N. **Bezzo** *Towards Trustworthy Swarming of Autonomous Vehicles*. MS Thesis, December 2021
- M. Gates, N. **Bezzo** *Towards Trustworthy Swarming of Autonomous Vehicles*. MS Thesis, October 2020
- T. Lin, N. **Bezzo** *Robust Robotic Operations in the Presence of Uncertainties*. MS Thesis, April 2018
- N. **Bezzo** *Coordination Strategies for Connected Robotic Networks*. PhD Thesis, October 2012
- N. **Bezzo**, J. Piovesan, R. Fierro, *Path Planning of Mobile Routers via Antenna Diversity*, SBIR Report, Marhes Laboratory, School of Electrical Computer Engineering, University of New Mexico, August 2011
- N. **Bezzo** *Low-Cost CMOS Non-Contact Profilometer*. MS Thesis, July 2008
- N. **Bezzo** *A Sensors Array for the Measurement of Electrical Currents (in italian – Array di Sensori per la Misura di Correnti Elettriche)*. BS Thesis, July 2006

- **Software Artifacts**

- N. Bezzo, P. Gebhard, J. Park, I. Lee, *ROSLab*: a high-level programming environment for robotic applications <http://precise.github.io/ROSLab/>
- N. Bezzo, P. Gebhard, M. Piccoli, I. Lee, *EMLab*: a high-level co-design environment for PCB electro-mechanical specifications.

Citation Count, H-index and i10-index

- **Google Scholar as of December 3, 2024:**

- citation count = 1419
- h-index = 17
- i10-index = 32

Graduate Students

- **Current PhD Students:**

- Jonathan Reasoner (ECE) – Projected Defense in 2027
- Woosung Kim (SIE) – Projected Defense in 2029
- Nick Mohammad (ECE) – Projected Defense in 2026 (passed Qualifying exam)
- Patrick Sherman (ECE) – Projected Defense in 2027 (passed Qualifying exam)

- **Current MS Students:**

- Avaneen Pinninti (CS) – Projected Defense in 2025

- **Former Graduate Students:**

- Shijie Gao (Ph.D. ECE 2024) – Now software engineer at DiDi
- Jacob Higgins (Ph.D. ECE 2024) – Now Systems Engineer at Zook
- Lauren Bramblett (Ph.D. SIE 2024) – Now at AFRL
- Garret Moore (M.S. CS 2023) – Now at Mitre
- William Clark (M.S. SIE 2023) – Now Systems Engineer at Metron
- Rahul Peddi (Ph.D. SIE 2022) – Now Systems Engineer at Zook
- Paul Bonczek (Ph.D. ECE 2022) – Now Systems Engineer at Johns Hopkins Applied Physics Lab
- Pravardhan Nagireddy (MCS CS 2022) – Now Robotics Engineer at Advanced Robotics
- Tianhao Wu (MCS CS 2022)
- Esen Yel (Ph.D. SIE 2021) – Now Postdoc at Stanford
- Phillip Seaton (M.S. ECE 2021)
- Christian Gall (M.S. ECE 2021) – Exchange student from TUM
- Mary Margaret Gates (M.S. CS 2020)
- Tony Lin (M.S. ECE 2018) – Now PhD student at Georgia Tech
- Vishaal Saraiya (M.S. MAE 2017) – Now Robotics Engineer at Apellix
- Bradley Hallier (M.S. ECE 2016 -2017)
- Rahul Vasist (UPenn PRECISE Center, M.S. CS 2015) – Now Firmware Engineer at Oracle
- Yanwei Du (UPenn GRASP Lab, M.S. ME 2015) – Now PhD student at Georgia Tech

Undergraduate Students

- **Current Undergraduate Students:**

- Shreepa Partaje (B.S. CS 2025)
- Zachariah Rishq (B.S. CS 2025)

- Leila Troxell (B.S. ECE 2025)
- Amelia Nist (B.S. ECE 2025)
- Kailey Brown (B.S. ECE 2025)
- Shrinidi Nadgouda (B.S. ECE 2025)
- Abigail Manalang (B.S. SIE 2025)
- Grace Weaver (B.S. SIE 2025)

● **Former Undergraduate Students:**

- Vihar Shah (B.S. SIE 2024)
- Jose Vallarino (B.S. SIE 2024)
- Matthew Heeter (B.S. SIE 2024)
- Oliver Olsen (B.S. SIE 2023)
- Kenny Chundu (B.S. ECE 2023)
- Sammy Nayhouse (B.S. SIE/ECE 2023)
- Samir Chadha (B.S. ECE 2023)
- Patrick Hourican (B.S. ECE 2023)
- Chase Moore (B.S. ECE 2023)
- Prithvi Kinariwala (B.S. CS 2022)
- Noelle Law (B.S. ECE 2021) – Now PhD at NYU
- Katie Kleeman (B.S. SIE 2021)
- Grace Glaubit (B.S. ESE/CS 2021) – Now Systems Engineer at Amazon
- Jeremiah Thomas (B.S. SIE 2021) – Now PhD at UC Santa Barbara
- Nikilesh Subramaniam (ECE 2021) – Now Electrical Engineer at Amazon
- Nicholas Anselmo (B.S. SIE 2020)
- Miller Garrett (B.S. SIE 2020)
- Shirley Wang (B.S. ECE 2020)
- Ryan Remias (B.S. ECE 2020)
- Matthew Trivett (B.S. SIE 2020)
- Anders Christoffersen (B.S. ECE 2020)
- Rohan Raval (B.S. CS 2019) – Now Software Engineer at UBER Robotics
- William Clark (B.S. MAE 2019)
- Grace Culver (B.S. CS 2019)
- Daniel Voce (B.S. ECE 2019)
- Jennavive Benko (B.S. ECE 2019)
- Candace Craig (B.S. SIE 2019)
- Patrick Mahan (B.S. ECE 2019)
- Ajay Patel (B.S. CS 2019)
- Atiena Branch (B.S. ECE 2018) – Now Software Engineer at Naval Research Lab
- Hazen Dean (B.S. SIE 2018)
- Victoria Marquis (B.S. SIE 2018)
- Rebecca Ho (B.S. SIE 2018)
- William Rainey (B.S. SIE 2018)
- Matthew Kimpel (B.S. SIE 2018)
- Joeseeph Ghiorzi (B.S. ECE 2018)
- William Cricchi (B.S. ECE 2018)
- Ryan D. Rosenfeld (B.S. CS 2018)
- Mark G. Restrepo (B.S. SIE 2018)
- William H. Gerard (B.S. MAE 2018)

- Walter E. Bruce (B.S. ECE 2018)
- Tahiya Salam (B.S. CS 2017) – Now PhD at UPenn
- Neeraj Gandhi (B.S. ECE 2017) – Now PhD at UPenn

Postdoctoral Researchers

- Carmelo Di Franco (2019 - 2020) – Now at AiTronik, Italy

External Funding

- **Awarded (Total to the PI = \$3,210,000)**

- *Epistemic Human-Robot Interaction for Every-day Collaborative Operations* Sponsor: Commonwealth Cyber Initiative; Amount: \$55,000 (Grant total: \$100,000); Duration: 09/01/2024 – 8/31/2025; Role: PI
- *Enhancing Human-Robot Collaboration through Mixed Reality Interactions* Sponsor: Commonwealth Cyber Initiative; Amount: \$33,000 (Grant total: \$100,000); Duration: 09/01/2024 – 8/31/2025; Role: Co-PI
- *Robotic Triage* Sponsor: Northrop Grumman, Amount: \$50,000, Gift; Role: PI; 09/2024
- *Detection, Prediction, and Intent Inference of Cyber-Physical Attacks in Learning-Enabled CPS* ; Sponsor: NSF CHEST; Amount: \$50,000; Duration: 08/01/2024 – 12/31/2025; Role: PI
- *Human-Robot Augmented Reality Smart Inspection* Sponsor: EnterAR/Siemens; Amount: \$10,000 (Grant total: \$10,000); Duration: 09/01/2023 – 5/20/2024; Role: PI
- *Autonomous Mission Management* Sponsor: Northrop Grumman, Amount: \$100,000, Gift; Role: PI; 09/2023
- *Voice Control and Motion Planning of Smart UAV for Public Safety* Sponsor: Commonwealth Cyber Initiative; Amount: \$33,000 (Grant total: \$100,000); Duration: 09/01/2022 – 2/29/2023; Role: PI
- *Towards Safe and Agile Robot Navigation in Occluding and Dynamic Environments* Sponsor: Amazon Research Awards, Amount: \$100,000, Gift; Role: PI
- *Risk-aware Detection, Prediction, and Mitigation in CPS under Cyber-Attack* Sponsor: NSF CHEST; Amount: \$100,000; Duration: 09/01/2022 – 09/01/2023; Role: PI
- *Autonomous Building Condition Detection and Evaluation (ABCDE)* Sponsor: CoStar Group; Amount: \$1,000,000; Duration: 01/01/2022 – 12/31/2024; Role: PI
- *Integrated Static and Dynamic Approaches to High-Assurance for Learning-Enabled Cyber-Physical Systems*; Sponsor: DARPA Assured Autonomy Program; Amount: \$ 498,000 (Grant total: \$5,000,000); Duration: 01/01/2018 – 03/31/2023; Role: Co-PI
- *Reverse Engineering Methodology for Resilient and Reconfigurable Autonomous CPS*; Sponsor: NSF CHEST; Amount: \$100,000; Duration: 08/01/2021 – 07/31/2022; Role: PI
- *SaTC: CORE: Small: Online Malicious Intent Inference for Safe CPS Operations under Cyber-attacks*; Sponsor: NSF; Amount: \$290,642; Duration: 09/01/2018 – 08/31/2022; Role: PI
- *CRI:II-New: The Living Link Lab: Infrastructure for Enhancing Occupant Experience and Building Operations*; Sponsor: NSF; Amount: \$188,000 (Grant total: \$754,568); Duration: 09/01/2018 – 08/31/2022; Role: Co-PI
- *Self-Assurance Modules for Autonomous Systems (SAMAS)*; Sponsor: AFRL; Amount: \$50,000; Duration: 03/01/2021 – 05/30/2021; Role: PI
- *Assured Planning and Control of Heterogeneous Robotics Systems*; Sponsor: LEIDOS; Amount: \$100,000 ; Duration: 09/01/2018 – 08/31/2021; Role: PI
- *Fly-Crash-Recover: Safe Recovery of Faulty UAVs*; Sponsor: MITRE; Amount: \$10,000; Duration: 09/01/2019 – 05/31/2020; Role: PI
- *FPV autonomous drone flight*; Sponsor: MITRE; Amount: \$50,000 ; Duration: 09/01/2018 – 12/31/2018; Role: PI

- *Development of Risk-based Attack Resilient State Estimation and Control of CPS* Sponsor: Booz Hallen Hamilton; Amount: \$ 10,000; Duration: 08/21/2017 – 05/30/2018; Role: PI
- *Development of Control-Aware Cyber Techniques for Attack-Resilient Industrial Control & Combat Systems* Sponsor: ONR BAA: N00014-16-R-BA04; Amount: \$320,000 (Grant total: \$2,700,000); Duration: 10/01/2016 – 09/30/2020; Role: Co-PI
- *CRITICAL Information and Infrastructure Identity and access Management Evaluation (CRII-IME)* Sponsor: MITRE; Amount: \$10,000; Duration: 09/01/2016 – 05/30/2017; Role: PI
- *Attack-Resilient Autonomous Vehicles* Sponsor: University of Pennsylvania; Amount: \$50,000; Duration: 01/01/2016 – 02/28/2017; Role: Co-PI

Internal Funding

- **Awarded (Total = \$583,000):**
 - *Purchase of 10 new Turtlebots 4 UVA*; 08/2024; Amount: \$55,000
 - *The dream about (Autonomous) Flying UVA Mead Endowment Program*; Duration: 9/23/2022 – 9/23/2023; Amount: \$3,000
 - *Assessing and enabling effective COVID-19 mitigation strategies to reduce indoor airborne exposures* UVA Internal Engineering in Medicine Award; Duration: 10/1/2020 – 9/30/2021; Amount: \$100,000
 - *Towards Learning Enabled Autonomous Infrastructure Inspection* UVA Internal Research Innovation Award; Duration: 7/1/2019 – 6/30/2020; Amount: \$60,000
 - *Enabling Robotic Operations in the Real World: A Cloud-based Visible Light Communication Approach* UVA Internal Research Innovation Award; Duration: 6/1/2017 – 8/30/2018; Amount: \$75,000
 - *Using flow models to improve quadrotors control and motion-planning* UVA Internal Research Innovation Award; Duration: 6/1/2017 – 8/30/2018; Amount: \$50,000
 - *Fully Autonomous Secure and Safe Transport (FASST)* UVA Internal Cyber-security Initiative Award; Duration: 08/29/2016 – 05/15/2017; Amount: \$100,000
 - *Cybersecurity Analysis - Cooperative Adaptive Cruise Control* UVA Internal Cyber-security Initiative Award; 08/29/2016 – 05/15/2017; Amount: \$60,000
 - *Graduate Curriculum in Robotics and Society* UVA Internal Education Innovation Award; 06/09/2016 – 05/15/2017; Amount: \$80,000

Invited Talks

- Presentation at Virginia Tech - Aerospace & Ocean Engineering Seminar *Multi-robot Epistemic Planning*, Blacksburg, VA, 27 November 2023
- Presentation at Amazon *Epistemic Planning of Multi Robotic Systems*, Virtual, 6 September 2023
- Presentation at ETH Zurich - Robotics series *I know that you know that I know: Epistemic Planning of Heterogeneous Robotic Systems*, Virtual, 15 August 2023
- Presentation at ICRA Workshop on Heterogeneity in Multi-Robot Systems *Towards Epistemic Planning of Heterogeneous Robotic Systems*, London, UK, 29 May 2023
- Presentation at Northrop Grumman University Research Symposium (virtual) *Autonomous Mission Management*, Virtual, 28 September 2022
- Presentation at DARPA PI Meeting, University of Pennsylvania, *DNN-based Verified Fast Run-Time Monitoring of Autonomous Systems*, Philadelphia, PA, 8 December 2022
- Presentation at 2021 CS Research Symposium, *Towards Resilient and Agile Autonomous Robots*, UVA, CS, 8 December 2021

- Keynote Presentation at 2021 Galois Balloween Workshop, *Safe and Agile Robot Motion Planing* , Virtual, 28 October 2021
- Presentation at DARPA PI Meeting, *Safe and Fast Planning and Control in Dynamic Environments* , Virtual, 14 October 2021
- Presentation at ICRA Workshop on Security and Privacy for Robotics, Paris, France, 27 May 2020
- Presentation at DARPA PI Meeting, University of Minnesota, *DNN-based Verified Fast Run-Time Monitoring of Autonomous Systems* , Minneapolis, MN, 16 March 2019
- Presentation at Galois, *Toward Resilient & Assured Autonomous CPS*, Portlan, OR, 19 December 2018
- Presentation at DARPA PI Meeting, UC Berkeley, *Fast Run-Time Monitoring of Autonomous Systems* , Berkeley, CA, 28 November 2018
- Presentation at 2 Accelerated Master's Program in Systems Engineering Seminars, *Toward Resilient & Assured Autonomous CPS*, Darden School, UVA, Charlottesville, VA, 21 September 2018 and 18 October 2019
- Presentation and Tutorial on CPS-cybersecurity to the Defense Intelligence Agency (DIA), UVA, Charlottesville, VA, 06 September 2017
- Presentation at the 2016 Jacobs Technology Days and the Hampton Roads Unmanned Systems Opportunity Exchange *Unmanned Systems Workforce*, Hampton, VA, 22 April 2016
- Presentation at the 2015 Safe and Secure Systems and Software Symposium (S5) *A Run time Monitoring Framework for Safe Coordination of Unmanned Aerial Vehicles*, Dayton, OH, 10 June 2015
- Invited speaker at NASA Jet Propulsion Laboratory, Pasadena, CA, 12 April 2012.
- Invited speaker at USC Robotics Research Lab, Los Angeles, CA, 13 April 2012.

Teaching

- SYS-6060/ECE-6501/CS-6501 "Autonomous Mobile Robots" – Fall '16 '17 '18 '19 '20 '21 '22 '23 '24
- SYS-3062 "Simulation Modeling" – Spring '17 '18 '19 '20 '21 '22 '23
- SYS-4053 "System Design Capstone" – Fall/Spring '17 '18 '19 '20 '21 '22 '23 '24

Internal Service

- **School Level:**
 - Member of the Reappointment Committee, 2024 - present
 - Member of the Committee on Academic Standards, 2023 - 2024
 - Funding member of the Link Lab, 2017 - present
 - Member of the Cyber-Security Search Committee, 2021, 2018, 2017
 - Member of the Link Lab CPS Search Committee, 2018, 2016
 - Co-organizer of the Link Lab Opening Ceremony, 2018 (Presentation on CPS Autonomy, Demonstrations, and Drone Ribbon-Cutting)
 - Panelist at Undergraduate Research Network's Research Fair, 2018
 - Live Lab Demonstrations to Visitors of the University (from Industry, Government, other schools), 2016 - present
 - Judge for URN Research Symposium, 2016
 - PhD Committee Member:
 - * Kayla Boggess, CS, 2025
 - * Siddharth Singh, MAE, 2025

- * Zeyu Mu, SIE, 2024
- * Christof Fehrman, Psychology, 2024
- * Ingy ElSayed-Aly, CS, 2024
- * Billy Smith, MAE, 2022
- * Varundev Sukhil, CS, 2021
- * Trey Woodlief, CS, 2020
- * Carl Hildebrandt, CS, 2020
- * Trent Weiss, CS, 2019
- * Steven Hauser, ESE, 2019
- * Yu Sheng, ECE, 2018
- * Dawei Fan, ECE, 2018
- * Masoud Bashiri, SIE, 2017
- * Jihanyu Su, SIE, 2017
- * Xiaomin Lin, SIE, 2017

- **Department Level:**

- Member of the SIE Vision Committee, 2023 - present
- Member of the Faculty Hiring Committee on OR and PHI, 2024
- Member of the SIE and CS P&T Committees, 2022 - present
- Head of the SIE "System Assurance and Resilience" Committee, 2020 - present
- Member of the Faculty Hiring Committee on Cyber-resilience, 2021
- Member of the Systems & Information Engineering Graduate Studies Committee, 2016 - present
- Member of the Computer Engineering Graduate Studies Committee, 2019 - present
- Open-House Lab demonstrations, 2016 - present

Professional Service

- **Journals, Conferences, and Workshops Organization:**

- Associate Editor for IEEE Transactions on Robotics (T-RO) – 2023 - present
- Associate Editor for IEEE International Conference on Robotics and Automation (ICRA) – 2024
- Organizing Committee member and Website Chair for 2022 International Conference on Robotics and Automation (ICRA) – 2020 - 2022
- Associate Editor for Robotics and Automation Letters (RA-L) – 2020 - 2022
- Area Chair for Conference on Robot Learning (CoRL) – 2020
- Program Committee Member of International Conference on Cyber-Physical Systems – 2024, 2023, 2022, 2020, 2019, 2018, 2017
- Program Committee Member of International Conference on Intelligent Robots and Systems (IROS) – 2023, 2021, 2020, 2019, 2022
- Session Chair at the International Conference on Intelligent Robots and Systems (IROS) – 2023, 2022, 2021, 2019, 2022
- Guest Editor of IEEE Computer Special Issue on Resiliency in Cyber-Physical Systems – 2019, 2018
- Session Chair at the International Conference on Cyber-Physical Systems (ICCPs) – 2018.
- Program Committee Member American Control Conference – 2018
- Session Chair at the American Control Conference (ACC) – 2018, 2016.
- Organizer of the "Robot Makers: The future of digital rapid design and fabrication of robots" (RoMa) workshop within the Robotics: Science and Systems (RSS) Conference – 2016, 2014
- Session Chair at the Adaptive Hardware and Systems Conference (AHS) – 2017.

- Session Chair at the International Design Engineering Technical Conferences & Computer & Information in Engineering Conference (IDETC/SIE) – 2015.
- Session Chair of International Symposium of Experimental Robotics (ISER) - Mechanisms Session – 2014.
- **Government Activities**
 - NSF Proposal Panels for SaTC, NRI, RI, FRR: 2019, 2020, 2021, 2022, 2023, 2024
- **Reviewer for:**
 - IEEE Robotics and Automation Magazine;
 - IEEE Transactions on Robotics;
 - IEEE Transactions on Automation Science and Engineering;
 - IEEE/ASME Transactions on Mechatronics;
 - IEEE Control Systems Magazine;
 - IEEE Robotics and Automation Letters;
 - Cambridge Robotica;
 - International Conference on Robotics and Automation (ICRA);
 - International Conference on Intelligent Robots and Systems (IROS);
 - Conference on Robot Learning (CoRL);
 - American Control Conference (ACC);
 - Conference on Decision and Control (CDC)
 - International Conference of Cyber-Physical Systems (ICCPS)
- **Member of:**
 - IEEE (Control Systems Society (CSS), Robotics and Automation Society (RAS), Systems, Man, and Cybernetics Society (SMC)) – 2007 - present
 - IEEE RAS Technical Committee (TC) on Multi-Robot Systems (MRS) – 2017 - present

Media/News Coverage

- SYS-6581/ECE-6501/CS-6501 course's competition featured in UVA News *Whose Robot Conquered the Cardboard Course, Taking Home the Coveted Golden Duckies?*, by Eric Williamson,, <https://engineering.virginia.edu/news-events/news/whose-robot-conquered-cardboard-course-taking-home-coveted-golden-duckies>
- *How Do You Get a Swarm To Think on the Fly? Create 'Empathy' With Other Robots, For One*, by Eric Williamson, <https://engineering.virginia.edu/news-events/news/how-do-you-get-swarm-think-fly-create-empathy-other-robots-one>
- AMR Lab and Research featured in Studio Aperto Mag, Italia 1 TV Station *Intelligenza artificiale per la sicurezza*, by Daniele Compatangelo , https://mediasetinfinity.mediaset.it/video/studioapertomag/intelligenza-artificiale-per-la-sicurezza_F312329301289C03
- SYS-6581/ECE-6501/CS-6501 course's competition featured in UVA Today *Putting It All on the Line*, by Audra Book ,, <https://news.virginia.edu/content/putting-it-all-line>
- *AMR Spot featured in Dean West SEAS Vision Campaign*, by Elizabeth Mather, https://www.youtube.com/watch?v=PGSLZZDtT_E
- *UVA welcomes Spot the Robot*, by Christopher Tyree and in CBS News, <https://engineering.virginia.edu/news/2021/04/see-spot>
<https://www.cbs19news.com/story/43688379/uva-welcomes-spot-the-robot>

- SYS-6581/ECE-6501/CS-6501 “Autonomous Mobile Robots” course’s competition featured in UVA News Article, *UVA Engineering Professor Outmaneuvers the Pandemic to Build a Better Competition*, <https://news.virginia.edu/content/navigating-obstacles-engineering-students-compete-robot-challenge-virtually>
- *Two AMR quadrotors were featured in the ribbon cutting ceremony of the Link Lab*, Link Lab Opening Ceremony, <https://www.wvtf.org/post/new-uva-lab-aims-combine-teaching-research-and-emerging-technology#stream/0>
- *The Autonomous Mobile Robots Lab at UVA*, by Mitchell Powers, UVA Today Video, <https://news.virginia.edu/video/UVAs-mobile-autonomous-robots-lab>
- *With the Rise of Autonomous Vehicles, Hackers Pose a Serious New Threat*, by Matt Kelly, UVA Today, <https://news.virginia.edu/content/rise-autonomous-vehicles-hackers-pose-serious-new-threat>
- *Robot, take the wheel: In University lab, engineers teach autonomous vehicles to navigate an unpredictable world*, by Caroline Kettlewell, VIRGINIA Magazine, https://UVAmagazine.org/articles/robot_take_the_wheel
- *Robot makers: The future of digital rapid design and fabrication of robots*, in RoboHub, <https://robohub.org/robot-makers-the-future-of-digital-rapid-design-and-fabrication-of-robots/>
- *UVA Professor, Students Use Robot to Help Restore Claudius Crozet Blue Ridge Tunnel*, by Taylor Gleason, NBC29
- *Into the Darkness: UVA Robot Maps Historic Tunnel*, by Matt Kelly, UVA Today, <https://news.virginia.edu/content/darkness-UVA-robot-maps-historic-tunnel>
- *Two exciting breakthroughs in autonomous vehicle cybersecurity, though questions remain*, in TechRepublic, <https://www.techrepublic.com/article/two-breakthroughs-in-autonomous-vehicle-cybersecurity-though-questions-remain/>
- *UVA Engineering Lab Brings Students, Professors Together for Collaboration*, by Pete DeLuca, NBC29.
- *Robot mapping news and Lab featured in the wikipedia page for the Blue Ridge Tunnel*, In Wikipedia, https://en.wikipedia.org/wiki/Blue_Ridge_Tunnel.
- *University of Virginia Maps Historic Tunnel Using Jackal UGV*, In Robotics Tomorrow and in Clearpath Robotics News, <https://www.roboticstomorrow.com/article/2018/01/university-of-virginia-maps-historic-tunnel-using-jackal-ugv/11206>.