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ACADEMIC AFFILIATION

September 2021 - Present Assistant Professor, Department of Mechanical and Aerospace Engineering, University of Florida

EDUCATION

August 2021 Ph.D., Mechanical Engineering, Cornell University
December 2019 M.S., Mechanical Engineering, Cornell University
February 2017 B.S., Naval Architecture and Ocean Engineering, Seoul National University
Summa Cum Laude

PUBLICATION

Refereed Journal Articles

1. Z. Huang, K. Volle, P. Ganesh, M. Moore, and J. Shin, “Information fusion for automatic target recognition using heterogeneous sensors,” in *(In Preparation)*
2. A. Pulido, Z. Bell, K. Volle, P. Ganesh, and J. Shin, “Uncertainty-aware guidance for target tracking subject to intermittent measurements using motion model learning,” in *(In Preparation)*
3. M. Bays, T. Wettergren, J. Shin, S. Chang, and S. Ferrari, “Persistent schedule evaluation and adaptive re-planning for maritime search tasks,” *Journal of Intelligent & Robotic Systems (In Review)*, 2023
4. A. Paradise, S. Surve, J. C. Menezes, M. Gupta, V. Bisht, K. R. Jang, C. Liu, S. Qiu, J. Dong, J. Shin, and S. Ferrari, “Realthasc – a cyber-physical xr testbed for ai-supported real-time human autonomous systems collaborations,” *Frontiers (In Review)*, 2023
5. A. L. Diaz, A. E. Ortega, H. Tingle, A. Pulido, O. Cordero, M. Nelson, N. E. Cocoves, J. Shin, R. R. Carthy, B. E. Wilkinson, and P. G. Ifju, “The bathy-drone: An autonomous uncrewed drone-tethered sonar system,” *Drones*, vol. 6, no. 10, 2022, ISSN: 2504-446X. [Online]. Available: <https://www.mdpi.com/2504-446X/6/10/294>

6. J. Shin, S. Chang, J. Weaver, J. C. Isaacs, B. Fu, and S. Ferrari, “Informative multiview planning for underwater sensors,” *IEEE Journal of Oceanic Engineering*, pp. 1–19, 2022. DOI: 10.1109/JOE.2021.3119150

Peer-Reviewed Conference Papers

1. A. Pulido, N. Sardinia, B. Sanders, P. Ifju, and J. Shin, “Coverage path planning for a robotics platform equipped with a side-scan sonar for underwater bathymetry mapping,” in *AIAA SCITECH 2024 Forum (Abstract Submitted)*
2. B. Herrin, V. Close, N. Berner, J. Herbert, J. Mindlin, S. Paez, R. James, and J. Shin, “Submodal: Modular underwater robot for rapid development and validation of autonomous systems,” in *OCEANS 2023, Gulf Coast (Abstract Accepted)*
3. A. Pulido, A. Diaz, A. Ortega, P. Ifju, and J. Shin, “Trajectory planning and control of bathy-drone: A drone towing a boat equipped with sonar for bathymetry mapping,” in *AIAA SCITECH 2023 Forum*, 2023, p. 1811
4. J. H. Ramos, J. Shin, K. Volle, P. Buzaud, K. Brink, and P. Ganesh, “Information-aware guidance for magnetic anomaly based navigation,” in *2022 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2022, pp. 6347–6354. DOI: 10.1109/IROS47612.2022.9981709
5. J. Shin, S. Chang, M. J. Bays, J. Weaver, T. A. Wettergren, and S. Ferrari, “Synthetic sonar image simulation with various seabed conditions for automatic target recognition,” in *OCEANS 2022, Hampton Roads*, 2022, pp. 1–8. DOI: 10.1109/OCEANS47191.2022.9977275
6. A. Pulido, R. Qin, A. Diaz, A. Ortega, P. Ifju, and J. J. Shin, “Time and cost-efficient bathymetric mapping system using sparse point cloud generation and automatic object detection,” in *OCEANS 2022, Hampton Roads*, 2022, pp. 1–8. DOI: 10.1109/OCEANS47191.2022.9977073
7. J. Shin, F. Kim, and S. Ferrari, “Deep generative model and reinforcement learning solutions to traveling salesman problems with unit circles,” in *AIAA SCITECH 2022 Forum*, 2022, p. 2209
8. S. Chang, J. Isaacs, B. Fu, J. Shin, P. Zhu, and S. Ferrari, “Confidence level estimation in multi-target classification problems,” in *Detection and Sensing of Mines, Explosive Objects, and Obscured Targets XXIII*, International Society for Optics and Photonics, vol. 10628, 2018, p. 1062818

GRANT AND CONTRACT SUPPORT

1. “Information-driven Trajectory Planning for Multi-Agent Target Tracking under Uncertainty”
Sponsor: Air Force Research Laboratory (AFRL)
Institutions: University of Florida
PI: Jane Shin (sole PI)
Total Award: \$573,976
Project Dates: February 1, 2023 - January 31, 2026

2. “Guidance Navigation and Control: Flight Laboratory Operations 2022”
 Sponsor: Air Force Research Laboratory (AFRL)
 Institutions: University of Florida
 PI: Jane Shin, Co-PI: Matthew Hale (UF)
 Total Award: \$2,050,480 (Shin share: \$1,784,265)
 Project Dates: September 13, 2022 - December 31, 2025

3. “The “Bathy-drone” for Underwater Survey, Mapping and Inspection”
 Sponsor: AURIGO SOFTWARE TECHNOLOGIES
 Institutions: University of Florida
 PI: Peter Ifju (UF), Co-PI: Jane Shin
 Total Award: \$575,452 (Shin share: \$181,890)
 Project Dates: November 1, 2022 - October 31, 2024

4. “The “Bathydrone” for Underwater Survey, Mapping and Inspection”
 Sponsor: AURIGO SOFTWARE TECHNOLOGIES
 Institutions: University of Florida
 PI: Peter Ifju (UF), Co-PI: Jane Shin
 Total Award: \$50,000 (Shin share: \$16,667)
 Project Dates: July 13, 2022 - December 31, 2022

5. “I-Corps: Real-time intelligent sensor path planning based on information value estimation”
 Sponsor: National Science Foundation (NSF) Division Of Industrial Innovation & Partnerships
 Institutions: Cornell University
 PI: Silvia Ferrari, Entrepreneurial Lead: Jane Shin, Technical Lead: Carlos Diaz-Ruiz, Mentor:
 Nathan Cook (Cornell University)
 Total Award: \$50,000
 Project Dates: August 1, 2020 – January 31, 2023

PROFESSIONAL AND HONOR SOCIETY MEMBERSHIPS

- Member, Institute of Electrical and Electronics Engineers (IEEE)
- Member, American Institute of Aeronautics and Astronautics (AIAA)

AWARDS

2020	Cornell Commercialization Fellowship
2019	Scientific Rigor, Sibley Graduate Research Symposium, Cornell University, Ithaca, NY
2014-2017	National Science & Technology Scholarship, South Korea
2014	SNU Tomorrow’s Edge Membership, College of Engineering, Seoul National University
2013-2014	Semester Honor Scholarship, Seoul National University

TEACHING

- Spring 2023 EML4312: Control of Mechanical Engineering Systems
Course covers the fundamentals of classical control, including system analysis using graphical tools, PID controller design, and aspects of state space systems.
Instructor, University of Florida
Instructor evaluation: 4.84/5.00 (response rate was 39/40 (98%))
- Fall 2022 EML4312: Control of Mechanical Engineering Systems
Instructor, University of Florida
Instructor evaluation: 4.67/5.00 (response rate was 30/40 (75%))
- Spring 2022 EML4312: Control of Mechanical Engineering Systems
Instructor, University of Florida
Instructor evaluation: 4.29/5.00 (response rate was 88/102 (86%))
- Spring 2020 MAE6780/ECE6780: Multivariable Control
Teaching Assistant, Cornell University
- Fall 2020 MAE6790/ECE6960: Intelligent Sensor Planning and Control
Teaching Assistant, Cornell University

PRESENTATIONS AND INVITED TALKS

- 2023 Presented the talk “Information-Driven Sensor Planning for Underwater Target Identification” at Underwater Surveillance Workshop at the 18th Korea Robotics Society Annual Conference (KRoC), February, 2023.
- 2023 Presented the talk “Active Sensing and Perception in Uncertain and Dynamic Environment” at Seoul National University, January, 2023.
- 2022 Presented the talk “Information-Theoretic Approach for Active Perception” at Amazon Lab 126, May, 2021.
- 2022 Presented the talk “Active Sensing and Perception for Autonomous Underwater Missions” at an Eco-friendly Smart Ship Seminar at Seoul National University, May, 2021.
- 2021 Presented the talk “Active Perception: Intelligent Search and Survey” at an MAE Department Seminar at the University of Florida, Mar., 2021.

OUTREACH

- 2022 Led a round table discussion with female students in the department of Naval Architecture and Ocean Engineering at Seoul National University about careers for women in STEM, June, 2022.

PROFESSIONAL EXPERIENCE

- August 2020 **NSF I-Corps**
Entrepreneur Lead, 2020 Summer Cohort, Austin, TX

- Developed a business model canvas to commercialize my research on information-driven planning by interviewing more than 100 professionals in autonomous driving industry for customer discovery
- 2020 **Cornell Commercialization Fellowship**
2020 Cohort, Cornell University, Ithaca, NY
 Led a team of five MBA students to further develop business model after NSF I-Corps, focusing on intellectual properties, partnership, and minimal viable product development
- 2017-2021 **Laboratory for Intelligent Systems and Controls**
Research Assistant, Cornell University, Ithaca, NY
 Collaboration with Naval Surface Warfare Center (NSWC) Panama City on a mine-countermeasure project to develop information-driven path planning algorithms and perform sea-trials
- 2016-2017 **Marine Control Robotics Laboratory**
Undergraduate Research Intern, Seoul National University, Seoul, Korea
 Thesis: Real-time hardware-in-the-loop simulation (HILS) of dynamic positioning of a rig
- January 2016 **Lloyd's Register**
Intern, Singapore, Singapore
- Jan.-Jul. 2015 **Fluid Structure Interaction Laboratory**
Research Intern, Polytechnique Montréal, Montreal, Canada
- August 2014 **Samsung Heavy Industry**
Intern, Geoje, Korea
- July 2014 **Hyundai Heavy Industry**
Intern, Seoul, Korea

GRADUATE STUDENT SUPERVISION

Ph.D. Dissertations Supervised and Funded

1. Andres Pulido, “Path and trajectory planning for active perception under uncertain environments and dynamics constraints”, Department of Mechanical and Aerospace Engineering, University of Florida, degree expected in 2026.
2. Baker Herrin, “Uncertainty-aware planning of autonomous underwater vehicles for high-resolution 3D environment mapping”, Department of Mechanical and Aerospace Engineering, University of Florida, degree expected in 2027.
3. Zijng Huang, “Sensor measurement and information fusion in a team of heterogeneous sensors for automatic target acquisition”, Department of Mechanical and Aerospace Engineering, University of Florida, degree expected in 2028.

Masters Theses Supervised

1. Sunmo Koo, “Transfer learning with photo-realistic sonar image simulation to overcome limited data for underwater object identification”, Department of Mechanical and Aerospace Engineering, University of Florida, degree expected in 2024.

2. Ruoyao Qin, “Computational and physical experiments on autonomous underwater object detection with low-cost imaging sonar and computer graphics simulations”, Department of Mechanical and Aerospace Engineering, University of Florida, December 2022.