Adnan Abdullah

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https://scholar.google.com/citations?user=0vWxyQMAAAAJ&hl=en

Professional Summary

PhD researcher in robotics and autonomous systems with hands-on experience in developing perception and navigation pipelines for GPS-denied, low-light, and sensor-degraded environments. My work focuses on robot vision and deep learning for SLAM and real-time inference using ROS-based pipelines, with validation through extensive field deployments on AUV and ROV systems. Proficient in ROS, Python, PyTorch, Linux, and sensor-driven autonomy.

Education

• PhD in Electrical and Computer Engineering, University of Florida (Jan 2023 – Present)
Advisor: Dr. Md Jahidul Islam | Concentration: Field Robotics & AI | Expected Graduation: Fall 2027
• Bachelor of Science in Electrical & Electronic Engineering, BUET (2021) | GPA: 3.73/4.00

Research Experience

Graduate Research Assistant, RoboPI Lab, University of Florida (Jan 2023 – Present)
• Designed **Ego-to-Exo** and **EgoExo++**: SLAM-driven AR-based teleoperation systems for ROVs.
• Developed **CaveSeg**: First underwater cave image dataset and a light transformer-based semantic segmentation pipeline for cave scene understanding with AUVs.
• Developed **CavePI** and **NemeSys**: Custom AUV platforms for semantic-guided underwater cave exploration and underwater magnetoelectric communication.
• Identified acoustic vulnerabilities of subsea data centers, proposed ROV agent-based threat detection, localization, and surveillance systems.
• Integrated SLM in an AUV mission programming interface; integrated LLM in a UGV platform for vision-language navigation and target discovery.
Undergraduate Research Student, DSP Research Lab, BUET (May 2019 – Dec 2020)
• Proposed a DL network for motion-artifact suppression in PPG signals for heart-rate estimation.

Marine Robotic Field Operations & Collaborations

• **Underwater Cave Exploration**: Collaboration with the Autonomous Field Robotics Lab at the University of Delaware; conducted tens of human-robot cooperative missions in underwater caves and grottos in Florida that paved the way for full autonomy in cave research. (Apr 2023 – Present)
• **Robotic Platform for Water Quality Monitoring**: Collaboration with the VTech Center for Ecosystem Forecasting; deployed prototypes in Falling Creek Reservoir, Vinton, Virginia. (Jun 2023)
• **Seabed Survey and Subsea Structure Mapping**: Collaboration with the FSU Coastal and Marine Lab; mapped reef and shipwreck sites with NemoSens AUV in the Gulf of Mexico. (Mar 2024)
• **Glider Trajectory Estimation**: Collaborative experiment during the Autonomous Systems Bootcamp at the University of Delaware; designed a trajectory forecasting model for Slocum gliders using live-streamed data from Delaware Bay area, Atlantic Ocean. (Aug 2024)

Selected Publications

• **A. Abdullah**, T. Barua, R. Tibbetts, Z. Chen, M. J. Islam, I. Rekleitis, "CaveSeg: Deep Semantic Segmentation and Scene Parsing for Autonomous Underwater Cave Exploration," *IEEE ICRA 2024*.
• **A. Abdullah**, R. Chen, I. Rekleitis, M. J. Islam, "Ego-to-Exo: Interfacing Third Person Visuals from Egocentric Views in Real-time for Improved ROV Teleoperation," *ISRR 2024*. [Best Paper Collection]
• A. Gupta, **A. Abdullah** (co-first author)**,** X. Li, V. Ramesh, I. Rekleitis, M. J. Islam, "Demonstrating CavePI: Autonomous Exploration of Underwater Caves by Semantic Guidance," *RSS 2025*.
• J. M. Sheldon, W. Zhu, **A. Abdullah**, K. Butler, M. J. Islam, S. Rampazzi, "Deep Note: Can Acoustic Interference Damage the Availability of Hard Disk Storage in Underwater Data Centers?," ACM HotStorage 2023. [Best Paper Award]
Full list available at: scholar.google.com/citations?user=0vWxyQMAAAAJ&hl=en

Presentations

• Presented "LC-MAP" poster at Nelms Annual IoT Conference 2025, FL, US.
• Delivered oral and poster presentations of "CaveSeg" at ICRA 2024, Yokohama, Japan.
• Presented two workshop papers ("Dense Water Quality Sensing" and "LightViz") at the RUNE Workshop, ICRA 2024, Yokohama, Japan.
• Showcased "DarkMask" project at the Center for Coastal Solutions Summit 2023, FL, US.

Awards & Honors

• Best Poster Award, Nelms Annual IoT Conference (2025)
• Best Paper Award, ACM Workshop on Hot Topics in Storage and File Systems (2023)
• Dean's Honors List, Bangladesh University of Engineering and Technology (2019)

Technical Skills

• Programming & ML: Python (PyTorch, OpenCV, Pandas), MATLAB
• Robotic Software: ROS1 Noetic, ROS2 Galactic/Humble, Gazebo, RViz
• Robot Platforms: BlueROV2, BlueBoat, Aqua2, NemoSens, ChasingM2, CavePI & NemeSys (custom)
• Edge-AI Devices: Nvidia Jetson Nano, Orin Nano, Xavier NX
• SBCs & HW: Raspberry Pi 4/5, Arduino, Pixhawk, DAD Board, IMU, LiDAR, Hydrophone
• Tools: Git, Docker, VS Code, Ubuntu Linux, LaTeX, MS Office

Leadership & Service

• Reviewed 20+ research papers for prestigious robotics conferences (ICRA, IROS, RSS, ISRR) and journals (IEEE T-HMS, T-CI, T-CSVT, JoE, RA-L, ACM T-HRI).
• Mentored the NemoGator team in building a biomimetic robot for marine ecosystem monitoring.
• Supervised two undergraduate students on CaveSeg dataset collection, labeling, and curation for semantic segmentation tasks.
• Conducted Building Nemo workshops and RoboGator Day demos under UF's RISE-CPET program.

Other Interests

Soccer, Travel, Scuba diving (certified open-water diver)