Azmyin Md. Kamal

Roboticist · IEEE RAS Student Member · U.S Permanent Resident

1315 Bob Pettit Blvd. Apt 48, Baton Rouge, LA-70820

(+1) 337-303-4174 | akamal4@lsu.edu | Mechazo11 | azmyinkamal | azmyin

Summary

Experienced Robotics researcher pursuing a Ph.D. in Mechanical Engineering, specializing in platform-agnostic, collaborative Visual SLAM frameworks, Robot Perception, 3D Object Detection, and Numerical Optimization. Additionally proficient in Deep Neural Networks with PyTorch, Data-Driven Control, ROS 1 & 2 ecosystems, CI/CD pipelines with Docker, Physics-based Robot Simulation, and upgrading legacy ROS packages. Expected to graduate in December 2025.

Skills

Programming	C++, Python, MATLAB, LaTeX, Markdown
Software Development	Git, Docker, Ruff, Doxygen
Robotics & Applied Mathematics	Visual SLAM, Optimization, Koopman Operators, Robot Navigation
Frameworks & Platforms	ROS 1 & 2, PyTorch, Space ROS
Software libraries (selected)	SciPy, Numpy, Numba, Eigen, Matplotlib
Deep Learning Methods	YOLO, LSTM, CNN
Simulation & Visualization	Open 3D Engine (O3DE), RViz, Pangolin

Experience

Graduate Research & Teaching Assistant — *Baton Rouge, Louisiana, U.S.A*
Louisiana State University — *Fall 21 - Present*

- Developing novel relocalization, metric-semantic mapping, and navigation algorithms for Keyframe VSLAM frameworks.
- In charge of the maintenance and upkeep for two RBKAIROS industrial-grade mobile manipulators, each valued at $90K.
- Taught Machine Design and Control Engineering courses, and conducted relevant labs.

Graduate Research Assistant — *Lafayette, Louisiana, U.S.A*
The University of Louisiana at Lafayette — *Fall 19 - Summer 2021*

- Developed a novel COVID-19 data analysis tool and a multimodal indoor positioning system.
- Mentored Undergraduate RAs in developing cyber-physical systems and applied machine learning.

Projects

Distributed, Collaborative Semantic-Mapping Module (Ongoing) | C++, Python, ROS 2, Rviz

- Developing a novel metric-semantic collaborative mapping framework for agents operating in GPS-denied environments.
- Modular and platform-agnostic design.

Solving Short-Term Relocalization Problems In MKVSLAM Using Spatial And Semantic Data | C++, Python, ROS 2, YOLOv5

- Developed a novel global pose recovery (relocalization) method for VSLAM frameworks using semantic and spatial data.
- The proposed method improved localization accuracy, extended operational lifetime, and demonstrated real-time performance.
- Paper presented in 2024 IEEE/ASME Internaitonal Conference on Advanced Intelligent Mechatronics (AIM). Code, Paper

ROS2 ORB-SLAM3 package | ROS 2, C++

- Developed a package that natively implements ORB-SLAM3 V1.0 in ROS 2 Humble. Code
- Repository has garnered over 30 stars and 5 forks, reflecting its usefulness and adoption within the community.

Integration of Open 3D Engine (O3DE) into Space ROS (Ongoing) | C++, ROS 2, Space ROS, O3DE, Docker

- Integrating this open-source engine to enable photorealistic, physics-based simulations within the Space ROS framework.

Niter2 Image-Space Triangulation Method | Python, Numpy, Numba

- Developed a Numba-accelerated python port of the "niter2" image-space two-view triangulation algorithm. Code

Anonymous Multi-User Tracking in Indoor Environment Using Computer Vision and Bluetooth | Python, PyTorch, Nvidia SBC

- Developed a novel multimodal indoor positioning system utilizing monocular images and Bluetooth RSSI data
- Master's Thesis. Manuscript available here

Multi-stage Logistic Growth Model for COVID 19 Infection Phase Analysis | Python, MATLAB, Data mining

- Developed a multi-stage logistic growth model based on a single-stage model written in MATLAB. Code
- Co-authored a Nature paper with this contribution. Paper

Deep Learning Projects | Python, PyTorch

- Developed a piano music generator using two Critic-Composer LSTMS. Code
- Implemented AlphaZero's Monte Carlo Tree Search algorithm in an 11x11 Gomoku game. Code

Education

Ph.D. in Mechanical Engineering (Ongoing) — *Baton Rouge, Louisiana, U.S.A*
Louisiana State University (LSU) — *Fall 21 - Present*

Master of Science in Engineering (M.S), conc. Mechanical Engineering — *Lafayette, Louisiana, U.S.A*
The University of Louisiana at Lafayette (UL Lafayette) — *Fall 19 - Fall 21*

Bachelor of Science (B.Sc) in Mechanical Engineering — *Dhaka, Bangladesh*
Ahsanullah University of Science and Technology (AUST) — *Fall 11 - Spring 15*

Honors & Awards

Graduate Teaching & Research Assistantship: NSF:NRI #2024795, *August 21 - December 24*
Graduate Teaching & Research Assistantship: UL Lafayette & NSF:RAPIDS #2027688, *January 20 - July 21*
Dean's List of Honor with Valedictorian Distinction: Ahsanullah University of Science & Technology (AUST), *November 16*