BIPIN SAHA

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SUMMARY

Ph.D. student with a strong focus on autonomous navigation and visual perception for robotics and self-driving systems. Proven expertise in LiDAR point cloud processing, camera–LiDAR fusion, and deep learning models. Hands-on industry experience deploying LLMs, multimodal AI, and scalable production ML pipelines. Published IEEE conference and peer-reviewed research, seeking applied R&D roles in autonomous systems.

EDUCATION

Ph.D. in Electrical and Computer Engineering — Expected Dec 2029
North Carolina A&T State University, Greensboro, NC — CGPA: 3.92/4.00
Relevant Coursework: Linear Control Theory, Digital Signal Processing, Fuzzy Logic, Embedded Computing System.

B.Sc. in Electrical and Electronic Engineering — Sep 2022
University of Rajshahi, Bangladesh — CGPA: 3.38/4.00

TECHNICAL SKILLS

AI & Perception: PyTorch, Transformers, LLMs, VLMs Multimodal AI, Visual–LiDAR Fusion, YOLO, OpenCV
Programming: Python, C/C++, ROS2, MATLAB
ML & Algorithms: Generative AI, Deep Learning, Neural Networks, RAG, Explainable AI (XAI)
Systems & Tools: Docker, FastAPI, Git, Linux, PostgreSQL, Vector DBs (Milvus, ChromaDB)

EXPERIENCE

Graduate Research Assistant — Aug 2025 – Present
ACCESS Lab, North Carolina A&T State University — Greensboro, NC

- Developing unsupervised LiDAR 3D object detection pipelines using DBSCAN, K-Means, and PCA to enhance autonomous vehicle perception.
- Implementing state-of-the-art BEVFusion and self-supervised frameworks to optimize camera-LiDAR sensor integration.
- Conducting research on visual navigation and path-planning algorithms for unstructured environments.

Machine Learning Engineer — Dec 2023 – Feb 2025
Business Automation Ltd. — Dhaka, Bangladesh

- Engineered an end-to-end handwritten prescription digitization pipeline using layout analysis and OCR, reducing manual data entry workload by **52%** across 64,000+ patients.
- Designed agentic Retrieval-Augmented Generation (RAG) architectures using LLaMA-3 and vector databases for enterprise search applications.
- Optimized Large Language Model (LLM) training via QLoRA and PEFT, achieving a **3.2x reduction in memory usage** while accelerating inference speed.

Assistant IoT Engineer — Jan 2023 – Nov 2023
Get-Aid Ltd. — Dhaka, Bangladesh

- Deployed YOLOv5 object detection models to enable real-time grocery product recognition for mobile robot automation.
- Integrated computer vision modules with embedded microcontrollers to ensure low-latency processing.

PUBLICATIONS (SELECTED)

- **Saha, B.**, Mondal, B.K., Mostaque, S.K., Hossain, M., Hossain, J., "Numerical Modeling of $CuSbSe_2$-Based Dual-Heterojunction Thin-Film Solar Cell with CGS Back Surface Layer," *AIP Advances*, vol. 13, no. 2, 2023.
- **Saha, B.**, Taton, T.K., Islam, M.H., Islam, M.J., Mostaque, S.K., "Enhancing Vehicle Detection in Adverse Weather Using a Weighted YOLO Ensemble and Explainable AI," *Proc. International Conference on Quantum Photonics, Artificial Intelligence and Networking (QPAIN)*, 2025.
- **Saha, B.**, Islam, M.J., Mostaque, S.K., Bhowmik, A., Taton, T.K., Chowdhury, M.N.H., et al., "Bangladeshi Native Vehicle Detection in the Wild," *arXiv preprint arXiv:2405.12150*, 2024.

LEADERSHIP ROLES

- **Chairperson**, IEEE Robotics and Automation Society, University of Rajshahi
- **Secretary**, IEEE University of Rajshahi Student Branch