TOUHID AHMED

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TouhidAhmed

RESEARCH INTERESTS

- AI computing for communication networks
- Deployment pipelines for AI on heterogeneous accelerators
- Standardized benchmarking and reproducible evaluation of AI hardware

EDUCATION

May 2022 – September 2024
Darmstadt, Germany

Master of Science in Electrical Engineering,
Darmstadt University of Applied Sciences
- Major: Automation
- Grade: 2.1 (Gut)
- Thesis topic: Design and implementation of a fleet management web application focusing on software architecture, reliability, and testing of distributed systems.
- Relevant academic topics: Control systems, Industrial Robotics, Computer vision.

May 2015 – May 2019
Dhaka, Bangladesh

Bachelor of Science in Electrical and Electronic Engineering,
North South University
- Awards: **Magna Cum Laude with Honors**
- **Thesis Topic:** Multi-Robot system in Intruder Detection and Apprehension, Search, Rescue, and Disaster Management

PUBLICATIONS

June 2022

A ROS-based Voice Controlled Robotic Arm for Automatic Segregation of Medical Waste Using YOLOv3, IEEE
- Designed and Developed a low-cost robotic arm for medical waste segregation using ROS and YOLOv3
- Measured an overall accuracy of 82% through 30 trial runs

December 2020

Autonomous Intruder Detection using a ROS-based Multi-Robot System equipped with 2D-LiDAR Sensors, IEEE
- Developed a Gazebo simulation of a multi-robot intruder detection system using Robot Operating System (ROS) framework
- **Project Demonstration: Link**

November 2020

Dual-Order Resource Allocation in 5G H-CRAN Using Matching Theory and Ant Colony Optimization, IEEE
- Developed a dual-order 5G H-CRAN resource allocation algorithm using matching theory and ant colony optimization, achieving higher average data rate, access rate, and throughput than baseline methods.

June 2020

A Real-Time Controlled Closed Loop IoT Based Home Surveillance System for Android using Firebase, IEEE
- Developed a low-cost Home surveillance system that can be authorized and regulated remotely with the help of an Android application
- **Conference Paper Presentation: Link**

RELEVANT PROJECTS

April 2023 – August 2023

Simulation of Autonomous Mobile Robot in Warehouse Management System
- Built an AI-enabled warehouse robotics demonstrator on the TC200 robot and performed **system-level validation** of object detection and 6D pose estimation under real operating constraints.
- Integrated **Gen6D**, **YOLOv8/SSD**, **RANSAC**, and **P-control** for parallel motion tracking, then tested robustness across varying lighting, occlusions, and viewpoints.

- Deployed **gmapping SLAM** and tuned local/global planners to achieve **reliable autonomous navigation**, improving recovery behavior and consistency during runs.

October 2020 – January 2021

e-Yantra Robotics Competition, Online participation

- Developed ROS1 packages for mapping, path planning, obstacle avoidance, and object handling for an AGV.
- Achieved fully autonomous indoor navigation and object transport in a simulated environment.

Automatic Bengali License Plate Detection and Recognition

- Trained a model in which YOLOV4 is implemented to detect and crop Bengali license plates.
- Super-resolution algorithm is also used to enhance the image quality of the cropped license plates
- An autocorrect NLP library is used to improve the accuracy of the recognized Bengali text.

WORK EXPERIENCE

April 2024 – October 2025
Rüsselsheim, Germany

Software Developer, SEGULA Technologies Services GmbH

- Developed Python-based **data processing and evaluation tooling** to support vehicle-data workflows and **reproducible reporting pipelines**.
- **Fleet Management Web App:** Designed backend architecture with REST APIs, authentication, and reporting; implemented **verification and validation** via unit, integration, and UAT tests.
- **Desktop Reporting Tool:** Built a GUI application to parse Excel/Parquet datasets and generate reports/visualizations, enabling **consistent data-driven evaluation** and traceable outputs.
- **RFQ Dashboard:** Automated PDF information extraction with OCR preprocessing to improve downstream **LLM summarization quality**; focused on robustness across document formats.

July 2023 – March 2024
Rüsselsheim, Germany

Intern, SEGULA Technologies Services GmbH

- Evaluated technical, operational, and financial feasibility of communication methods for swarm vehicle testing.
- **AI Recruiter** — Automated candidate outreach by parsing LinkedIn profile data and feeding a templated prompt to the **OpenAI API** to compose personalized messages. Used **Selenium WebDriver** for automating web-based application testing.
- Implemented an algorithm in Python for turn detection in urban street networks; used OSMnx for geospatial data workflows.

July 2023 – September 2023
Rüsselsheim, Germany

Working Student, SEGULA Technologies Services GmbH

- Implemented an algorithm in Python for turn detection in urban street networks; used OSMnx for geospatial data workflows.

August 2022 – October 2022
Darmstadt, Germany

Intern (Automation Test Engineer), TechRoad GmbH

- Worked with CAN, SOME/IP, Automotive Ethernet, UDS, and CANoe.
- Supported verification/validation workflows for automotive ECUs.

TECHNICAL SKILLS

Programming & Software Engineering: Python, C++; Linux Development; Git.

Perception & ML: OpenCV, TensorFlow, scikit-learn; feature-based detection (SIFT/SURF/ORB/FAST/BRIEF); deep detectors (YOLOv3/v8, SSD); pose estimation (Gen6D); data preprocessing and evaluation.

Tools & Hardware: LiDAR, cameras, sensors & actuators; Raspberry Pi, Arduino; CANoe; LabVIEW; PSpice; SISTEMA, MATLAB/Simulink, CANoe, Wireshark

Scientific Computing and Python Libraries: NumPy, Pandas, Matplotlib, Scikit-learn, TensorFlow, OpenCV, Pillow, BeautifulSoup, Tkinter, PyQt

Robotics & Control: ROS1, Gazebo, RViz, MoveIt, ROS navigation stack; SLAM (gmapping, EKF), path planning (Dijkstra, A*, DWA, Navfn), PID/LQR tuning, basic MPC concepts; multi-robot coordination & simulation