AKSHAT PANDEY

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Website: akshatowl.github.io

EDUCATION

Texas A&M University *College Station, Texas*
Master of Science in Computer Engineering *GPA: 3.84 / 4.0* Aug 2023 - May 2025(Expected)
Coursework: Deep Reinforcement Learning, Software Engineering, Distributed Systems, Machine Learning

Manipal Institute of Technology *Manipal, India*
Bachelor's in Electronics and Communication Engineering *GPA: 8.69 / 10* Jul 2019 - Jun 2023
Minor in Computational Mathematics

SKILLS

Programming	C, C++, Python, Java, MATLAB
Website toolkit	HTML, CSS, Javascript, SQL, Firebase, MongoDB, Express JS, REST APIs
Software Stacks	ROS, ROS-2, Qt, Qml, Ardupilot, OpenCV, OpenAI, PyTorch
OS and other tools	Windows, Linux, Shell, Bash, Git, Docker, Kubernetes, CMake, Markdown
Hardware & Embedded	NVIDIA Jetson, Raspberry Pi, Pixhawk, UART, SPI, I2C, CAN

EXPERIENCE

Applied Materials *Sunnyvale, California*
Software Engineering Intern May 2024 - Aug 2024

- Developed the real-time control flow of a multi-setpoint generator for Endura PVD in C++ 20.
- Optimized the system architecture to reduce the size of compiled binaries by 25% for x32 and x64 architectures.
- Implemented interlocks to restrict unwanted behaviors in hardware based on simulated sensing data.
- Integrated hardware IOs through XML config files with an OnChange service in C++, reducing latency by 95%.

Autonomous Systems Lab, Texas A&M University *College Station, Texas*
Graduate Researcher Oct 2024 - Jan 2024

- Visualized a path-planning algorithm in 3D space with dynamic obstacles using MILP formulations in Python and the Gurobi solver.

Analog Devices *Bengaluru, India*
Software Engineering Intern Jan 2023 - May 2023

- Deployed obstacle detection in Gazebo with a skid-steer robot and Time-of-Flight sensor data using ROS and C++.
- Published images on ROS-2 Humble using OpenCV C++ on NVIDIA Jetson reducing the latency by 66.7%.
- Adapted robotic arms for robust pick-and-place algorithms using Moveit! framework and Gazebo.

Mechatronic and Robotic Systems Lab, Ontario Tech University *Oshawa, Canada*
Research Intern May 2022 - Jul 2022

- Worked on an autonomous wheelchair for children with physical disabilities as part of the MITACS Fellowship.
- Integrated slope detection using OpenCV and Intel D435i depth-cameras in ROS with a 98% accuracy.
- Implemented collision-free navigation with RRT* and a PD controller as the local planner on Gazebo and a Raspberry Pi-4 Turtlebot3 prototype.

PROJECTS

LLM for domain-specific queries: A ChatGPT3-based LLM that specifically solves queries related to machine learning and deep learning. This used an Express JS server and multi-modal Javascript and Java clients. Firebase and MongoDB were the databases used to store user conversations.
https://github.com/akshatowl/MLDL-ChatBot

Neural Architecture Search using Reinforcement Learning: Optimized Graph Neural Architecture Search targeted for the CiteSeer dataset with Trust Region Policy Optimization and Proximal Policy Optimization to a trainer RNN model. Used Pytorch to find GNN architectures and got a mean validation accuracy of 73.6 % equivalent to the original method. https://github.com/akshatowl/GraphNAS

KOBU: A coverage planning arrangement for multi-agent systems with Hilbert's and Peano curves simulated using C++ and ROS in the Gazebo Simulator. https://github.com/raghavthakar/kobu

EXTRA-CURRICULAR ACTIVITIES

Head of Automation at Project MANAS. Led a team of 50+ undergraduate students in the automation front of a driverless car and an autonomous hexacopter for AUVSI SUAS 2022. (Mission Rank: 17)

Semifinalist in the Swadeshi Microprocessor Challenge 2020 innovating with an indigenous FPGA board and USD 1250 in funding by the Govt. of India.