# AKSHAT PANDEY

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Website: akshatowl.github.io

## EDUCATION

**Master of Science in Computer Engineering**, Texas A&M University ⟶ Aug 2023 - Present
Coursework: Deep Reinforcement Learning, Software Engineering, Distributed Systems and Algorithms

**Bachelors in Electronics and Communication Engineering**, Manipal Institute of Technology ⟶ 2019 - 2023
Minor Specialization in Computational Mathematics Cumulative GPA: 8.69/10

## SKILLS

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|---|---|
| **Programming** | C, C++, Python, Java, MATLAB |
| **Website toolkit** | HTML, CSS, Javascript, SQL, Firebase |
| **Software Stacks** | ROS, ROS-2, PX4, Ardupilot, OpenCV, OpenAI, PyTorch |
| **Software** | Gazebo, CoppeliaSim, MissionPlanner, QGroundControl, Simulink, Blender, Fusion 360 |
| **OS and other tools** | Windows, Linux, Git, Docker, Kubernetes |
| **Hardware & Embedded** | Arduino, Raspberry Pi, Pixhawk, Communication Protocols(UART, SPI, I2C) |

## EXPERIENCE

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

- Programmed a ROS package in C++ and Python for simulations using Time-of-Flight sensor data in Gazebo.
- The simulation was showcased at the Analog Devices' global technical conference 2023.
- Published images through ROS-2 and OpenCV, reduced the latency by 66.7%.
- Integrated the Moveit! framework and Gazebo to set up robotic arms for robust pick-and-place algorithms.

**Undergraduate Research Intern** ⟶ May 2022 - Jul 2022
Ontario Tech University ⟶ *Oshawa, Canada*

- Simulated an autonomous wheelchair as part of the MITACS Fellowship under Dr. Scott Nokleby.
- Slope detection using OpenCV and Intel D435i depth-cameras in ROS. Got up to 98% accuracy.
- Implemented SLAM in ROS and Gazebo with depth cameras and laser-scanners.
- Optimized and achieved collision-free navigation with RRT* and a proportional controller as the local planner.

**Embedded Software Intern** ⟶ Aug 2021 - Nov 2021
AEREO ⟶ *Bengaluru, India*

- Made a Software In Loop testbench using Gazebo-9 and MissionPlanner with the Ardupilot stack for quadcopters, reducing manual testing time by 40%.
- Set up an API in C++ 17 to send coordinates as vectors for autonomous navigation of the aerial vehicle.

## PROJECTS

**Seraphim** A hexacopter capable of autonomous waypoint navigation and image recognition. This was a team effort during my time in Project MANAS. Link: https://www.youtube.com/watch?v=CQ0x2UGOluc

**Iterative Inverse Kinematics** Iterative Inverse Kinematics of a 3-DoF RRR robotic arm using the Newton-Raphson root solving method and got 99% convergence Link: https://github.com/akshatowl/Iterative-Inverse-Kinematics

**KOBU** A research idea to explore space-filling curves for coverage planning in multi-agent systems.
Link: https://github.com/raghavthakar/kobu

**Visual Slope Detection** Slope detection of obstacles using OpenCV and an Intel D435i, published as a data stream through a rostopic (ROS-1). Link: https://github.com/akshatowl/VisualSlopeDetection

## EXTRA-CURRICULAR ACTIVITIES

- National Semi-finalist in the Swadeshi Microprocessor Challenge 2020. Among the top 100 teams across India. My team built a smart automated storage and retrieval system (ASRS) using an indigenous FPGA board.
- International Semi-finalist in the Mohamed Bin Zayed International Robotics Challenge (MBZIRC). Among the top 14 teams internationally and the only Indian team to qualify (Team Luna).
- 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.