ISHANI NARWANKAR

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EDUCATION

Northwestern University — **Evanston, IL**
Masters of Science in Robotics — December 2024

The University of Texas at Austin — **Austin, TX**
Bachelor of Science, Aerospace Engineering, Minor in Entrepreneurship — May 2023

SKILLS

- **Hardware:** Solidworks/Fusion360/CATIA/OnShape, Quadcopters, Additive Manufacturing, Rapid Prototyping, Soldering
- **Programming:** Python, C++, C, MATLAB, Lisp, Jekyll, Bash, Pytorch
- **Robotics:** ROS/ROS2, Feedback/Control Systems, Embedded Systems, SLAM, MoveIt, OpenCV, RVIZ, Gazebo
- **Software:** Linux, Git, CMake, Unit Tests, Ardupilot/Ardusub/PX4, Visual Studio, QGroundControl, ANSYS, Mujoco

WORK & RESEARCH EXPERIENCE

Monterey Bay Aquarium Research Institute (MBARI), Moss Landing, CA, *CoMPAS Lab – SLAM Intern* June - Aug 2024
- Developed and implemented classical and machine learning point cloud registration methods using C++ and Python
- Generated synthetic datasets using field data (pointclouds) from PNW gathered using Multibeam Echosounder sonar
- Evaluated accuracy and reliability of single and multi-step registration methods on generated datasets
- Deployed developed registration methods for SLAM-based sonar use on autonomous underwater vehicle in field (Monterey Canyon)

Skydio, San Mateo, CA

Hardware Reliability and Test Intern – Electronics Development Lead — May - Sept 2023
- Constructed and programmed proof-of-concept water test rig for long-term rain IPX2 testing
- Lead electronics development of new generation controller for reliability team
- Evaluated production quality differences between batches of antennas and hinges to finalize supplier choice

Hardware Reliability and Test Intern – Windwall Engineer — May - Aug 2022
- Designed, built, and programmed open-air windwall to mimic customizable gust patterns for product development and testing
- Implemented a full-feedback system for project in C and Python to improve data analysis, test repeatability, and customizability
- Designed waterproofing solutions and finalized manufacturing line instructions to include solution in product's final assembly
- Lifecycle tested products with thermal chamber, windwall, and spinracks

Texas Aerial Robotics (TAR) UT Austin, Texas, *President* Aug 2019 – June 2023
- Founded and co-lead 2023 UT Raytheon Drone Innovation Competition Team (won 2nd place overall)
- Designed, manufactured, and implemented sensors for unmanned ground vehicle
- Planned organization showcases and oversaw obstacle avoidance and swarm technology projects
- Engineered 3-ft quadcopter frame and electronics for International Aerial Robotics competition

Autonomous Group of Texas Robotics and Oden Institute, UT Austin, *Research Assistant* June 2021-May 2022

Data Driven Cyber Physical Systems, Demonstrate Additive Manufacturing Functionality on Hexacopter
- Optimized 3D printer's nozzle holder design using CAD with Fusion360
- Coded and validated inertia matrix model in MATLAB using flight data from PX4
- Integrated singletact force sensors to improve print quality of 3D printer module

Swarm Technology Research Project
- Created flock workspace to connect and control TELLO edu drones using ROS2
- Developed test programs to determine success of controlling multiple drones using Python and C++

Texas Rocket Engineering Lab (TREL), UT Austin, *Recovery Avionics Responsible Engineer* Sept 2019 - 2021
- CADded and built prototype mounts and hardware for recovery system using Solidworks and SLA printers
- Self-learned ANSYS for finite element analysis of designs to understand impact on design and materials
- Outlined and managed first set of ground and drop tests for recovery avionics hardware system

PROJECTS

Underwater SLAM and Waypoint Navigation for Underwater Rover (Python, ROS2) Dec 2023 – Apr 2024
- Developing a Python, ROS2 Package for monocular SLAM and autonomous underwater waypoint navigation
- Coding Python library for underwater depth control and stabilization
- Updating mechanical design of existing low-cost underwater rover to achieve neutral buoyancy in indoor pool

Simultaneous Localization and Mapping (SLAM) from Scratch (C++, ROS2) Dec 2023 – Apr 2024
- Programmed an Extended Kalman Filter SLAM pipeline using C++ and ROS2 for simulation and real-life turtlebot3 robot
- Designed a kinematics control and odometry C++ library for the simulated turtlebot3

7-DOF Robot Arm for Autonomous Hangman Game (Python, ROS2) Sept – Dec 2023
- Led a team of 4 to develop a Python, ROS2 package for a Franka 7-DOF robot arm to play hangman with a human player
- Implemented a game setup ROS2 service for hangman gameplay with april tag calibration, MoveIt motion planning, and force control
- Designed and manufactured spring-loaded pen holder for Franka (designed to achieve team's fallback goal)