Nitin Vegesna

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EDUCATION

Georgia Institute of Technology Atlanta, GA
B.S. Computer Science. Senior with Intelligence and Theory threads. ***GPA: 4.0*** Dec. 2023
M.S. Computer Science with Machine Learning Specialization Dec. 2024

- Relevant Courses: Data Structures and Algorithms, Computer Organization and Programming, Probability and Statistics with Applications, Objects & Design, Intro to Artificial Intelligence, Intro to Perception and Robotics, Honors Algorithms, Machine Leaning, Applied Combinatorics & 2nd Level Linear Algebra & Undergraduate Research
- Spring 22 Relevant Courses: Number Theory, Automata and Complexity, Computing & Society, Undergrad Research

EXPERIENCE

Georgia Institute of Technology, STAR LAB, led by Prof. Harish Ravichandar Atlanta, GA
Undergraduate Research Jan 2023 - Current

- Research on Human-Robot Interaction, in which robot anticipates and reacts to human actions in lab environment in real time.

Georgia Institute of Technology Atlanta, GA
Undergraduate Teaching Assistant Aug 2022 - Dec 2022

- Teaching assistant for Fall 2022 CS 3630 - Introduction to Perception and Robotics teacher by Professor Frank Dellaert.
- Assisting with creation of projects. Assist students with course content in Office Hours. Grading assignments and exams.

NASA Goddard Space Flight Center Greenbelt, MD
Software Development Engineering Intern May 2022 - Aug 2022

- Developed user interface using JavaFX and backend software that allows users to control robots using Bluetooth, Internet, or Amateur Radio.
- Provided Internet communication through Discord Bot that uses Inter Process Communication (JeroMQ) to pull the commands from UI and push to a Discord channel. The receiving Discord Bot authenticates and pulls these commands.
- Enabled satellite communication by transmitting commands as audio packets. Coded Linux pipeline to allow receiver to demodulate audio packets using RTL-SDR dongle and sends them to Direwolf for decoding and authenticating.
- Programmed robot close to receiver to read commands and operate accordingly using serial communication (pySerial).

Georgia Institute of Technology, Borg Lab, led by Prof. Frank Dellaert Atlanta, GA
Undergraduate Research Jan 2022 - May 2022

- Implemented GTSAM factor graph and Point-to-Line ICP algorithm to perform PoseSLAM on Unitree A1 quadruped.
- Map optimization and outlier removal led to precise mapping of the robot's surroundings/trajectory at various speeds/directions.

MIT Lincoln Laboratory Beaver Works - Autonomous Race Car Cambridge, MA
Summer Intern July 2020

- Implemented lane following, cone slaloming & wall following on an autonomous car with camera and LiDAR.
- Developed a neural network with 95% accuracy using LiDAR images. Finishes track on simulator autonomously.
- Participated in the final Grand Prix. Won the first place award in the wall following course of Time Trials.

PROJECTS

Software Development

- Full Stack (backend and frontend) development of game called Neon Strike that is a working and fun Tower Defense game.
- Employed Test-driven development practices and object oriented programming principles in JAVA & Android Studio.

Perception and Robotics

- Developed CNN and a fully connected neural network for a robot to navigate itself in a museum to art pieces using a rapidly exploring Random tree (RRT).
- Implemented ICP using GTSAM for Pose Graph Optimization to construct a 2D representation of a car's surroundings at a street.

Artificial Intelligence, Machine Learning, Data Structures and Algorithms

- Pacman search algorithms for efficiently completing the maze with different complexities. Implemented value iteration and Q-learning (reinforcement learning) for agent to make decisions that maximize its reward in the Pacman maze.
- Implemented Joint Particle Filtering Algorithm to track and locate multiple ghosts simultaneously in Pacman maze.
- Trained neural network regression model with 99% accuracy to predict movie ratings from Kaggle dataset that required data cleaning to fill in missing data and reformat feature data. Used Tensorflow to perform linear, lasso, and ridge regression.
- Implemented data structures like ArrayLists, LinkedLists, Stacks, Queues, Heaps, BSTs, AVLs, HashMaps & Graphs.
- Developed sorting, pattern matching, and graph algorithms in JAVA like Quick Sort, KMP, Rabin Karp, Dijkstras, and Kruskals. .

TECHNICAL SKILLS

Linux, Windows, GitHub, Java, MATLAB, C, C++, Tensor Flow, PyTorch, Python, Machine Learning

AWARDS, ACTIVITIES & CITIZENSHIP

- RoboJackets and The Agency Club, GeorgiaTech Faculty Award Fall 21, Spring 22 & Fall 22. U.S. Citizen.