ARNAV IYER

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EDUCATION

University of Texas at Austin Austin, TX   **August 2020 – June 2023**
B.S. Computer Science, GPA: 3.96; Courses: Data Structures and Algorithms, Architecture, Natural Language Proc.
Graduate Courses: Deep Learning, Autonomous Robots

TECHNICAL SKILLS

Languages: C++1x, Python 3, C, Java 8, JavaScript, Kotlin
Tools: ROS, Node.js, PyTorch, TensorFlow, matplotlib, OpenCV, Google Cloud

EXPERIENCE & RESEARCH

Apple, Inc. Cupertino, CA   **May 2021 – August 2021**
Motion Sensing Intern (Software), Infrastructure Group
- Built onto a web server to pull, analyze, store, and report motion sensor factory build data to engineers.
- Used Python 3, MongoDB, and Flask to build the server, and HTML/CSS/JS for report generation.
- Created dynamic data visualizations and analysis tools with various libraries (bokeh, plotly, matplotlib).

Autonomous Mobile Robotics Lab University of Texas at Austin, Austin, TX   **January 2021 - Present**
Research Assistant
- Engineered an anytime algorithm in **C++1x** to solve the Multi-Agent-Path-Finding (MAPF) problem using a windowing approach and information reuse that achieves first solution times strictly faster than standard algorithms (Conflict-Based Search) on a 100x100 four-connected grid with varying obstacle density.
- Optimized performance by leveraging code profiling with kcachegrind and efficient memory management.
- Created intuitive 2D and 3D visualizations of info reuse and path plans in matplotlib to understand and debug.

Computational Epidemiology Lab University of North Texas, Denton, TX   **January 2019 – August 2020**
Research Assistant
- Implemented a heuristic algorithm in **Python 3** to create makespan-optimal routes for medicine delivery from multiple warehouses to designated points of distribution in the event of an epidemic.
- Contributed my implementation to emergency response software used for [vaccine distribution](#) in Texas.

FTC #7172 Robotics Team Plano, TX   **June 2017 – April 2020**
Programmer
- Created an autonomous navigation system in **Java 8** using odometry localization and motion profiling for a wheeled robot. Robot trajectories generated to any point on the playing field utilizing tracking wheels that measure the position and orientation of the robot at any instant.
- Leveraged distance sensors, motor encoders, and limit switches to automate the stacking of blocks.
  Distinctions: FTC Worlds Division Finalist 2019, 6th Place in the World 2020

PROJECTS

Vehicle Obstacle Avoidance [<demo>](#)
- Programmed a LIDAR-equipped robot car using C++1x and ROS to autonomously navigate through any course of obstacles and perform J-Turns on reaching a dead end.
- Built a one-dimensional time optimal controller for motion profiling and a greedy path-planning algorithm to generate and evaluate robot trajectories based on path length and clearance. Implemented a particle filter to localize the robot within a building given the building map.

Going Places [<code>](#) [<demo>](#)
- Created a unique closed-loop route generator highlighting local attractions using Google Cloud APIs, Node.js, WebSocket, CockroachDB, and HTML/CSS/Bootstrap.
- Applied Jarvis's algorithm and Google's Places and Directions API to create a route from a convex hull of a set of locations. Routes of interest stored using Cockroach DB.
  Distinctions: HackTX Hackathon Winner

D* Lite Algorithm Visualizer [<code>](#)
- Implemented the D* Lite path planning algorithm in C++ with an interactive OpenCV visualization.

LEADERSHIP

FIRST Global STEM Corps Conakry, Guinea; Tangier, Morocco   **Summer 2018/2019**
- Taught Java and mechanical design in French to the Guinean and Moroccan FIRST Global robotics teams.