Siddharth Saha

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Experience

AVAmobility

February 2023 – Present

Head of Autonomy and Principal Software Engineer / Architect — *Maui, HI*

- Senior most lead in all things autonomy at AVAmobility
- Startup focusing on autonomous shuttle service b/w key locations at Maui
- Evaluating sensor choices and configurations for car
- Designing software architecture/pipeline for urban navigation to several tourist spots

AI Racing Tech

May 2021 – Present

Lead Software Engineer and Stack Developer in Indy Autonomous Challenge — *Indiana/Las Vegas/Texas*

- On-site lead responsible for deployment and integration of all software on our team's Indy Autonomous Challenge racecar
- Developed C++ ROS 2 driver to connect to N instances of Luminar Iris, control parameters and retrieve sensor health and pointcloud information
- Developed generator for C++ ROS 2 CAN drivers given DBC files. Used to generate drivers for Raptor, Motec, Spacedrive, TTPMS and Brake Temps in Indy Autonomous Challenge
- Optimized drivers to reach 30-60% reduction in CPU load and 70%+ reduction in latency
- Developed CI testing pipeline using Github Actions
- Developed C++ ROS 2 Path Planner that takes behavior and an occupancy grid to generate trajectories to follow. Employs Kinodynamic Curvilinear Sampling and Parallel Path Generation for efficiency
- Developed C++ ROS 2 Behavior Planner that takes into account current environment conditions, perception, race control commands and general goal of the race to make decisions and execute. Modified for race rules every season. Based off Behavior Trees
- Developed interface to open source Unity based OSSDC simulator. Made use of Python API to create custom scenarios and multi ego environments
- Developed co simulation option using ChassisSim by integrating into MATLAB and Simulink to load into Unreal Engine based Carla
- Developed Scenario Runners for simulations using Bazel and gRPC microservices to interface with varying autonomy and simulation services
- Developed C++ ROS 2 Kalman Filter for localization that fuses wheel speeds, IMU and GPS to achieve highly reliable estimations during GPS dropouts via dead reckoning
- Developed C++ baseline lidar preprocessing and detection stack using Autoware.Auto

Triton AI

January 2021 – March 2023

Lead Software Engineer and Consultant — *San Diego, CA*

- Competed in evGrandPrix, ICRA, F1TENTH and DIY Robocars competitions
- Lead for the evGrandPrix Autonomous Challenge 2022
- Integrated Indy Autonomous Challenge Solution to go kart
- Developed baseline stack that makes use of ROS2 Nav2 to navigate in racing environments. Uses costmaps and GPS to navigate and stay within bounds while avoiding obstacles

University of California, San Diego

March 2020 – March 2023

Instructional Assistant/Tutor/Teaching Assistant — *San Diego, CA*

- Tutored for Introduction to Autonomous Vehicles, Principles Of Data Science, Programming and Basic Data Structures for Data Science, Data Structures and Algorithms for Data Science, Practice and Applications of Data Science, Machine Learning: Representation and Data Science Capstone - Robotics
- Ran discussion sections in person for entire section of class
- Answered student questions and provided office hours for interactive feedback
- Helped developing assessments in both direct examination and homework

Education

University of California San Diego September 2021 – March 2023
MS Computer Science (Robotics Specialization) *GPA: 3.7*

University of California San Diego September 2018 – June 2021
BS Data Science (with Minor in Mathematics - Probability and Statistics Specialization) *GPA: 3.9*

Awards and Honors

Indy Autonomous Challenge, Third Place January 2023
- Third place podium finish at the Indy Autonomous Challenge @ CES 2023 in Las Vegas Motor Speedway. Head to head autonomous racing format using the Dallara AV-21

Indy Autonomous Challenge, Second Place November 2022
- Second place podium finish at the Indy Autonomous Challenge @ Texas Motor Speedway. Head to head autonomous racing format using the Dallara AV-21

evGrandPrix Autonomous, Second Place May 2022
- Second place podium finish in the evGrandPrix Autonomous Series 2022. Single car timed lap format with the evGrandPrix platform

evGrandPrix Autonomous, Third Place September 2021
- Third place podium finish in the evGrandPrix Autonomous Series 2021. Single car timed lap format with the evGrandPrix platform

Halıcıoğlu Data Science Institute Scholar Award June 2021
- Students selected for this award have achieved a top 25 cumulative GPA in the Data Science department and have also been recognized by department faculty for both their academic achievement and positive contributions to the Data Science community at UC San Diego.

UC San Diego Cum Laude 2021 June 2021
- Latin Honors. Top 14% of Graduating Seniors

F1TENTH IROS 2020 Third Place October 2020
- Won 3rd place at F1TENTH IROS 2020 Autonomous Racing Competition as a single man team

Projects/Volunteering

Capstone Research September 2020 - March 2021
- Autonomous 1/10th scale car that uses image inputs to localize, detect lanes and cones and drive around track while avoiding cones. Uses Gazebo for localization testing
- Featured on Jetson Community Projects as Project of the Month March 2022

Smart Letterboard April 2022 - June 2022
- The Smart Letterboard enables verbal communication with others without the use of voice or hand movement

Skills

Programming Languages C++, Python, MATLAB/Simulink, Java, SQL, HTML/CSS/JS
Robotics ROS2, ROS, OpenCV, PCL, Eigen, Nvidia Jetson, Arduino
Deep Learning Pytorch, Image Classification, Detection and Segmentation
Data Analysis Numpy, Pandas, Seaborn, Matplotlib, Dask, Apache Spark, Tableau
Tools Git, Docker, Continuous Integration