

SHRUTIKA

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EDUCATION

Master of Computer Science (Intelligent Robotics) | University of Southern California

Coursework: Analysis of Algorithms, Robotics, Information Retrieval, Deep Learning

Aug 2023 - May 2025 (EXP)

Los Angeles, CA, USA

Bachelor of Computer Science | MIT World Peace University

Coursework: Algorithms, Database, Data Science I & II, Machine Learning, Artificial Intelligence, OS, Computer Networks

Apr 2017 - May 2021

Pune, India

TECHNICAL SKILLS

Programming: C, C++, Python, CUDA, PyTorch, Tensorflow, Javascript, NextJS, ReactJS, Flask, MongoDB, MySQL

Algorithms: A*, Kalman Filter, Particle Filter, RRT, PRM, Bayesian Networks, Probability Theory, SLAM, Reactive Planning

Robotics: Mathematics, Probability, LPC, PID, MPC, Eigen, Control System, ROS2, Gazebo, MoveIt, URDF, Sensors/Drone, LiDAR, IMU, Motor Drivers & Controllers, Multi Threading, Logging, Kuka Bots, Ghost Bots, Solid Works

AI Frameworks: LLM, LLama 2, GPT, GAN, LSTM, BERT, RasaNLU, CNN, RNN, Deep Generative Models, Reinforcement Learning, NLP, Transformers, MPC, Scikit-learn, TensorflowLite, OpenCV, YoloV5

MicroController: Raspberry PI (RPI), Arduino, Peripheral Interface Controllers (PIC), STM, CAN, I2C, UART

Others: AWS (Ec2, AWS Bedrock, S3, DynamoDB, Lambda), GCP, Docker, Kubernetes, Kafka, RabbitMQ, Redis, Android, Linux, Git.

EXPERIENCE

Robot Locomotion And Navigation Dynamics (RoboLAND) Lab | C++, LLM, Llama2, MultiThreading, ROS2 **Los Angeles, US**

Research Assistant under Professor Feifei Qian for NASA Funded Project

Oct 2023 – Present

- Developing Risk aware Reactive Path Planning for Legged robots (Ghost Robotics) to intelligently adapt to Planetary exploration.
- Generating continuous moisture and stress logs using C++ Multithreading and Mavlink, and fine tuned Llama2 to Generate Information.

Spendflo | Python, LLM, RAG, BERT, OCR, Vector Indexing, Pine Cone, MongoDB ReactJS, Nodejs, SQL

Chennai, India

Software Engineering (Machine Learning)

Oct 2022 – Aug 2023

- Formulated a **RAG** technique employing **Vector Graph Indexes** in Pine Cone to reduce mapping time for **85000+** transaction records per customer from 15+ days to under 5 minutes. Received **first prize** in the AI Hackathon for achieving a **0.95** confidence ratio.
- Architected Scheduler and Consumers for scrubbing real-time usages by leveraging Amazon SNS, Kafka, Redis, and AWS, leading to a **25%** reduction in manual workload, led a team of 10 software and data science interns.

Webonise Lab | Python, NLP, GNN, RasaNLU, Regraph, Reactjs, AWS, Docker

Pune, India

Software ML Engineer

Dec 2020 - Feb 2022

- Integrated multi-cluster **Graph Neural Net** for secure file transfer and communication within the organization for Reco.ai (Context Powered SaaS AI Security App). Orchestrated a data privacy and access control system, reducing data exposure risk across SaaS by **25%**.
- Managed Release of the “drf-singularity” repository to optimize payment transactions, resulting in a **15%** reduction in failure rates.

FlytBase Labs | C++, ROS, Precision Landing, CNN, DroneSDK, Kinect Camera, PID, IMU

Pune, India

Robotics Engineer

Aug 2020 – Dec 2020

- Calibrated IMU and Gyroscopes for easy deployment of drone fleets, and simulated drone trajectory in MATLAB.
- Implemented Precision Landing and hover with Google Maps API to facilitate drone navigation by using polylines.
- Delivered reliable, well-tested software for autonomous drones by improving and automating our internal tools, our development environment, programming practices, and building ROS libraries, resulting in an **18%** performance boost.

Codex Rocks | Software Intern | Remote, Australia

May 2018 – Feb 2020

- Designed frontend using Reactjs, and Rxjs and added production connectivity to make changes to the DynamoDB utilizing concurrency and RabbitMQ to trim video lecture service, reducing execution time from **600ms to 60ms**.

PROJECTS

Asia-Pacific Broadcasting Union (ABU) INTERNATIONAL ROBOCON COMPETITION | C++, OpenCV, ROS, GAZEBO, LiDAR, MATLAB

Created simulation environments for robots to throw shuttlecocks using ROS and Gazebo. Integrated holonomic chassis with Omni wheels using 3 and 4-point Bezier curves in Matlab. Utilized OpenCV for gyroscopes and Lidar sensors for path planning. **Runner-up among 112 colleges worldwide**

Chat Bot at INDIAN INSTITUTE OF SCIENCE (IISc) | PyTorch, LLM, GPT, BERT, Android

Designed an Android app integrated with a Doctor Bot Using GPT to predict the spread map of the pandemic across various parts of India. Won 1st Prize for this Project at Summer School among 90+ participating students

Path Planning | Python, Kalman Filter, C++, EKF, URDF, ROS, RVIZ, GAZEBO

Programmed various search-based algorithms like Breadth First Search, Depth First Search, Dijkstra, A*, WA* in C++ and Python for shortest path finding in a map, Integrated state estimation through Visual Inertial Odometry and Error State Kalman filter

Dynamic route planning for Indoor Navigation | C++, Python, A*, RRT, SLAM, Turtlebot

Developed a pipeline using laser-based SLAM (mapping) to obtain the map of the environment, integrated A* and RRT* for real-time path planning.

B.TECH THESIS at Collaborative Research Development Forum (CRDF) | Python, Vector Indexing, OpenCV, SQL

Formulated algorithms to detect corners in Vector images by intersecting straight lines and Bezier Curve elements and saved disk space by **46%**

Autonomous Mobile Robots Simulation and SLAM | C++, Computer Vision, OpenCV, SLAM, AMCL, YOLO V5

Simulated mother and child bot to autonomously play various park games, detection via colors. Designed URDF model and arena. Deployed SLAM and Navigation using the Dijkstra algorithm and simulated pick and place operation. Contributed to control, motion planning, and integration of the robot

PATENT & PUBLICATIONS

PATENT for Education Facilitating System For Visually Impaired Persons: Developed An IoT device to educate “visually-impaired people” movement provided by 30 servo motors arranged in DeBruijn sequence representing 6-dot braille configuration holes, with two Ph.D. Professors.

RESEARCH PAPER for Voice Assistant For Ubuntu Implementation Using Deep Neural Network: Designed a Ubuntu-Voice Assistant that performs actions based on voice command utilizing a 6-layered DNN to convert .wav files to text, and implemented a Sequential Bidirectional Neural Network

- Winner of Space Robotics Competition at IIT, Bombay TechFest among 200 teams

- Got 1st Place in AI Hackathon on Impact of News Sentiments for Stock Markets hosted by WorldData.ai and RMDS Labs.

- Selected at Google Summer of Code, GSOC-2020 for Open Source Contributor at Accord Project