Vaidehi Som

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Education

Indian Institute of Technology Jammu, India — Aug. 2017 – June 2021
Bachelor of Technology in Mechanical Engineering — *CGPA: 3.372/4*

K.L. International School, India — 2017
Higher Secondary School — *Percentage: 90.5%*

Technical Skills

Languages: Python, C++, MATLAB
Frameworks: ROS, Gazebo, RViz, PyTorch, Tensorflow
Libraries: Pandas, NumPy, Matplotlib, OpenCV, Sklearn, etc
Others: Deep Learning, Localization, Mapping and SLAM, Path planning and Navigation, Computer Vision

Experience

Mobile Robotics Engineer | *C++, Automated Guided Vehicle* — August 2021 – Present
Addverb Technologies, Noida, India

- Working with automated mobile robot using LIDAR, IMU, and QR codes for navigation
- Development of Navigation stack. Implemented controllers and lower level driver
- Improved odometry with calibration, controllers, and IMU infused data using Kalman filter
- Developing algorithm reading QR code information for robot's localization

Research Intern | *Python, Deep Learning, GANs, Style Transfer* — July 2020 – August 2020
Dr. Harkeerat Kaur, IIT Jammu

- Generated fingerprints by applying the concept of Cycle-GANs
- Implemented Neural Style Transfer algorithm using VGG architecture
- Combined both algorithms to generate secure fingerprints

Research Intern | *Python, Deep End-to-End learning, Ultrasonic sensor, Camera* — May 2019 – July 2019
Dr. Virendra Singh, IIT Bombay Certificate/Report

- Developed deep learning model for self driving car based on behavioral cloning and for object detection
- Compared performance between testing on ultrasonic sensor and camera image. Performed data augmentation
- Compared usage of end to end learning for object detection vs path following

Projects

Robotic Arm | *Python, Kinematics, Microcontrollers, PID controller* — March 2021 – June 2021

- Development of 6 dof Robotic arm for 2 kgs payload *Video/Report*
- Programmed for forward and inverse kinematics, able to follow predefined curve
- Used PID for each motor

Gesture Recognition System | *ROS, Gazebo, Python, Deep Learning, Computer Vision* — June 2020 – Dec 2020

- Detected hand landmarks using pose estimation algorithms obtaining accuracy of 87% *Video/Report*
- Key-points detected using Intel-RealSense Camera were used to define various gestures
- Simulated robotic arm using ROS and Gazebo to perform pick up tasks
- Gestures were employed to control simulated Robotic Arm, computer screen, and mouse

Quadruped robot | *ROS, Gazebo, Python, IMU, Arduino, ROS Navigation Stack* — June 2021 – Present

- Fabrication of Quadruped, inspired by MIT spot micro *Video*
- Communication of motors and motor drivers
- Integrated IMU data, via arduino, for improved odometry and balance
- Using ROS Navigation stack

Research: Biometric Transformation using Deep Learning | *Python, Computer Vision* — Feb 2021 – Present

- Aiming to transform human biometrics using Deep Learning

- In collaboration with the National Institute of Informatics, Japan and the Government of India

Mobile Robot: Simulation and SLAM | *ROS Navigation stack, C++, AMCL, EKF, Gazebo* May 2021 - June 2021
- Designing URDF model and arena *Video*
- Used gmapping for 2D and RTABMap for 3D mapping
- Localization using AMCL
- Deployed SLAM and Navigation using Dijkstra algorithm on our robot and simulated pick and place operation by synchronizing ROS parameters
- Simulation of Ball chasing robot, detection via colors

Combat Robot|*Drive and weapon motors, Motor controllers, Transmitters, receivers, ESC* Oct 2019 – Dec 2019
- Self-designed and fabricated the combat bot which in turn is capable of destroying other bots using its weapon mechanism consisting of a rotating drum *Video/Certificate*
- Led the team of 6 members for participating in Robowars event at IIT Bombay's TechFest
- One of the 20 teams selected from all over India for the main event at IIT Bombay
- The bot was manufactured to battle with other bots in 15kgs category

Relevant Coursework

Undergraduate Coursework
Computer Vision, Machine Learning, Control Theory

Online courses
- C++ Nanodegree from Udacity *Certificate*
- **Robotics**: Robotics Software Engineer Nanodegree from Udacity, Robotics Specialisation from Coursera (Ongoing), Controls for Mobile Robotics
- **Machine Learning**: Audited Stanford's CS 230-Deep learning. Completed Deep Learning specialisation from Coursera

Achievements

Bus Route Optimization | *Python, Constraint programming, OR Tools, Google Map API* Dec 2019
- Earned silver prize amongst all 20 participating IITs at national level *Certificate*
- Event of Inter-IIT Tech Meet'19 organized and judged by BOSCH

Prof. Sudhir K. Leadership Award | *Leadership award* April 2021
- Given to two students from the whole university on the basis of contributions made in leadership towards the university's student activity *Link*

Window Cleaning Robot | *Solidworks, EDF concept* Jan 2020
- Designed a novel model for window cleaning robot in Tech Fest, IIT Ropar using Solidworks. 3rd position out of 15 teams
- Used Electric Ducted fans(EDF), speed controller, IR/IMU sensors, Drivers, and Arduino Mega in design

Automated Traversing Robot | *Arduino* March 2019
- Secured 1st position in Technunctus- Inter college Tech Fest, IIT Jammu
- Built an arduino controlled bot. Using it as a prototype, studied driving pattern recognition using motion sensors

National Creativity Olympiad: AIR 6 2015

NTSE Stage-1 2012

Extracurricular

Position of Responsibility
- Career and Development Cell of IIT Jammu branch representative, 2018-2020
- Coordinator of Sponsorship team for the first Industrial Conclave of IIT Jammu, 2019 *Certificate*

Others
- Have interviewed prominent personalities in various fields, 2019-2021 *Blogs*
- Established Kritash, the social club of IIT Jammu which aims to mentor less privileged children, 2017-2018
- Lead the women's badminton team of IIT Jammu in Badminton in the Inter IIT Sports meet, 2018 held at IIT Guwahati *Certificate*
- Represented IIT Jammu in Chess in the Inter IIT Chess meet, 2017 held at IIT Madras *Certificate*