Vaidehi Som

+1(215)397-5735 | vaidehisom.github.io | som.vaidehi920@gmail.com | linkedin

Education

University of Pennsylvania, U.S.A Aug'22 – May'24
Master of Science and Engineering in Robotics

Indian Institute of Technology Jammu, India Aug'17 – June'21
Bachelor of Technology in Mechanical Engineering *CGPA: 3.372/4*

Technical Skills

Languages: C++, Python
Frameworks: ROS, Gazebo, RViz, PyTorch
Developer Tools: Linux, CMake, Git,VS Code
Libraries: NumPy, Matplotlib, OpenCV, Sklearn, Pandas

Experience

Mobile Robotics Engineer | *C++, Automated Guided Vehicle* Aug'21 – Jun'22
Addverb Technologies, Noida, India

- Worked with automated mobile robot using LIDAR, IMU, and QR codes for navigation
- Developed and implemented linear and rotation controller packages and lower level driver for navigation stack
- Improved odometry with calibration, controllers, and IMU infused data using Kalman filter

Research Intern | *Python, Deep Learning, GANs, Style Transfer* May'20 – July'20
Dr. Harkeerat Kaur, IIT Jammu

- Conceptualized from start to end- AI-driven biometric privacy using modified cycle GANs
- Implemented encoders-decoders, compared different matching algorithms, implemented image augmentation techniques, heatmap, used latent vectors, and prepared datasets
- In collaboration with the National Institute of Informatics, Japan and the Government of India

Research Intern | *Python, Deep End-to-End learning, Ultrasonic sensor, Camera* May'19 – July'19
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, PID controller* March'21 – June'21

- Developed and programmed 6 dof Robotic arm for 2 kgs payload *Video/Report*
- Implemented forward and inverse kinematics equations executed by micro controllers for position control of DC motors
- Programmed to follow predefined curve. Modifiable to perform pick/place using different end effectors
- Used PID for each motor

Gesture Recognition System | *ROS, Gazebo, Python, Deep Learning, Computer Vision* June'20 – Dec'20

- Implemented non-max suppression, cross-entropy loss, and detected hand landmarks *Video/Report*
- Detected key-points using Intel-RealSense Camera, were used to define various gestures
- Simulated robotic arm using ROS and Gazebo to perform pick up tasks
- Enhanced robotic arm decisions using gesture inputs

Quadruped robot | *ROS, Gazebo, Python, IMU, Arduino, ROS Navigation Stack* June'21 – Sept'21

- 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

Mobile Robot: Simulation and SLAM | *ROS Navigation stack, C++, AMCL, EKF, Gazebo* May'21 - June'21

- Simulated ball chasing robot, detection via colors. Designed URDF model and arena *Video*
- Implemented localization using AMCL, gmapping for 2D and RTABMap for 3D mapping
- Deployed SLAM and Navigation using Dijkstra algorithm on our robot and simulated pick and place operation by synchronizing ROS parameters

Combat Robot|*Drive and weapon motors, Motor controllers, Transmitters, receivers, ESC* Oct'19 – Dec'19

- 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

- **Graduate Coursework**: Machine Perception, Machine Learning, Control and Optimization, Linear Algebra
- **Online**:*C++ Nanodegree-Udacity*, *Robotics Software Engineer Nanodegree-Udacity* , *Controls for Mobile Robotics*, Pursuing *Photogrammetry I II* and *Mobile Sensing and Robotics*-Cyrill Stachniss

Achievements

Bus Route Optimization | *Python, Constraint programming, OR Tools, Google Map API* Dec'19

- 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'21

- 1 of 2 students from IIT Jammu selected for initiatives and contributions made in leadership towards university's student activity *Link*

Window Cleaning Robot | *Solidworks, EDF concept* Jan'20

- 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'19

- 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

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

- Interviewed prominent personalities in various fields, 2019-2021 *Blogs*
- **Volunteering:** Co-established Kritash, the social club of IIT Jammu which aims to mentor less privileged children. Taught children of construction workers under this initiative, 2017-2018
- Led 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*