HARSHAL S. BHAT

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EDUCATION

Worcester Polytechnic Institute(WPI), Worcester, MA, USA   **Aug 2023 - Present**
MS in Robotics engineering

Veermata Jijabai Technological Institute(VJTI) , Mumbai, India   **Aug 2018 - June 2022**
Bachelor of Technology(Distinction) in Mechanical Engineering CPI 8.28/10

TECHNICAL SKILLS

Programming Languages: Python, C/C++, Matlab, SQL, Pyspark
Libraries: Pytorch, Tensorflow, OpenCV, Matplotlib
Environments/Tools: Linux, Git/Github, ROS, AWS, CARLA, Jupyter, MS Office, Qliksense, ANSYS

PATENTS AND PUBLICATIONS

CONFERENCES [1] Speaker at the International Conference on Industrial Tribology (ICIT),2022, New Delhi
"Vibration Analysis of Hydrodynamic Conical Journal Bearing, Fault Prediction using Machine Learning"
PATENTS [2]"An Autonomous System For Low Payload Gripper Changing Mechanism and its Method Thereof" – (published) The Indian Patent Office Journal No. 05/2022, Dated 04/02/2022, Part 1, pp. 24, Application no. (202211000649)   **PATENT**
REGISTERED DESIGNS [3] "Automatic Harvester" – (published) The Indian Patent Office Journal No. 12/2022, Dated 25/03/2022, Part 4, pp. 92 Application no. (356209-001)   **DESIGN LINK**

EMPLOYMENT

Technology Consultant D&A, Pricewaterhouse Coopers LLP   **July 2022 – Aug 2023**
- Achieved seamless AWS cloud migration for 50 procedures, optimizing strategy, AWS configuration, and data migration.
- Transformed 25 Qlik applications, enhancing data visualization impact with 80% faster upload while ensuring utmost accuracy.

Research & Development Intern, Indian Institute of Technology, Ropar   **May 2021 – Aug 2021**
- Designed an autonomous harvesting robot for 15 vegetables, featuring self-navigation. Engineered a bidirectional G2V/V2G Simulink charger for 1.5-hour robot recharge. Executed ROS simulation, integrating YOLO v7 and obstacle detection to enhance navigation.

TECHNICAL EXPERIENCE

Projects

Conditional Monitoring of Conical Journal Bearing using Machine Learning   (Sep 2021 – April 2022)
- Led Conical Journal Bearing Test Rig (CJBTR) project, extracting vibration data at 10 loads/speeds.
- Pioneered SVM fault classifier achieving 85.71% accuracy, alongside deep dive into CNN using FFT, spectral kurtosis, and kurtograms inputs. Executed Random Forest, KNN comparison with SVM.

Vehicle Dynamics Team Member, VJTI Racing (Feb 2020 – April 2021)
- Led Vehicle dynamics team to deliver parameters affecting vehicle performance. Working with a 25-member team to design an All-Terrain Vehicle for BAJA SAE 2021 INDIA and bagged **AIR 18** in the 4WD category
- Mini-project lead with work on Electrically Heated Disk type catalytic convertor control module to achieve a 15% reduction in emissions

Self-Driving Cars Project Stack   (April 2020 – Sep 2020)**VIDEO 1 | VIDEO 2 | VIDEO 3**
- Dynamic simulation of Self-driving car: Implemented lateral control and longitudinal control in CARLA for pose estimation based on Kalman filter with 98% accuracy
- Developed an object collision system using OpenCV & Neural networks (semantic segmentation) for estimating drivable space
- Developed and implemented a robust behavioral cloning system for autonomous vehicles utilizing end-to-end imitation learning. Achieved an impressive 97% model accuracy through meticulous training and fine-tuning techniques. Successfully simulated and validated the model's performance within the Udacity simulator environment.
- Devised an Adaptive Cruise Control (ACC) System in MATLAB and Simulink, employing Model Predictive Control (MPC) to enable precise longitudinal speed management for following vehicles across varied speed profiles.
- Orchestrated optimization of gas pedal actuation sequencing within the ACC system, achieving a harmonious balance between maintaining a safe distance from the lead vehicle and providing a comfortable ride through meticulous parameter tuning.

ADDITIONAL EXPERIENCE AND AWARDS

1st Runner up IEEE VJTI technical paper presentation: Behavioral cloning for self-driving cars pipeline

Startup Grant: Received startup grant of INR 10 lakhs, iHub-AWaDH, IIT Ropar, India   **VIDEO**