Aadhar **Chauhan**

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Education

University of Washington — *Seattle, WA, USA*

M.S. in Data Science Mechanical Engineering - GPA 3.86/4.0 — *Sept. 2021 - Jun. 2023*

National Institute of Technology — *Kurukshetra, India*

B.Tech in Mechanical Engineering - GPA 9.14/10 — *Jul. 2013 - Jun. 2017*

Skills

Programming Python, MATLAB, C, SQL, Latex, C++

ML Frameworks PyTorch, Tensorflow, Tensorboard, Keras, OpenCV, NumPy, Pandas, Matplotlib

Developer Tools VS Code, PyCharm

Evidence of Excellence

- Demonstrated expertise in designing and implementing deep learning algorithms to fuse misaligned thermal and visual images captured from different camera sensors. Utilized advanced skills in Pytorch, Python, and Git to successfully develop and deploy the image fusion model.
- Ensured the accuracy and reliability of calibration by actively participating in field validation and testing of SUVs, during my tenure as a Senior Research Engineer at Mahindra.

Experience

Control and Trustworthy Robotics Lab (CTRL) — *University of Washington, Seattle*

Research Assistant — *Jun 2022 - Present*

- Fused thermal and visual images (Multi-modal data) utilizing the autoencoder architecture in an unsupervised manner with mutual cross attention at the bottleneck, for the human detection in search and rescue missions. (Skills : PyTorch, Python, Linux)
- Working on developing an end-to-end pipeline for the fusion of misaligned thermal and visual images using Generative Adversarial Network (GAN) architecture. (Skills : PyTorch, Python, Azure ML)

Mahindra & Mahindra — *Mahindra Research Valley, Chennai*

Senior Research Engineer — *Aug 2017 - Jul 2021*

- Led the winter validation expedition of BS6 SUV in Manali, India and successfully improved the regeneration interval by over 100km and enhanced fuel efficiency. Analyzed the collected data using Python and other tools and provided crucial inputs to strengthen the calibration.
- Devised a neural network based DOC (Diesel Oxidation Catalyst) plant model using PyTorch & researched on DOC thermal mapping to control and optimize fuel required to regenerate the DPF to increase the fuel efficiency for the engine.
- Optimized the combustion parameters for Diesel Engines by working on Design of Experiments (DOE) to maximize the temperature of exhaust gas entering DOC (Diesel Oxidation Catalyst) to generate a suitable environment for DPF (Diesel Particulate Filter) regeneration.

Projects

3D-AI-Camera-Aided VTOL-Multirotor Vehicle Control and Landing with INSITU- a Boeing Company — *Jan 2022 - Jun 2022*

- Built an AI-camera(OAK-D) enabled controller with depth perception and object detection to land a multi-rotor VTOL (Vertical Take-off and Landing) vehicle into a moving confined space.
- Reduced latency for the integration of the multi-rotor VTOL vehicle and the AI camera by implementing multiprocessing, to run both systems concurrently. (Skills: Python Multiprocessing, OpenCV)

ASL Detection and Letter Prediction — *Feb 2022*

- Developed a program to recognize hand gestures in 3D space using a single low-resolution camera to display American Sign Language (ASL) as English Letters in real-time.
- Trained the model on YOLO and used the trained model with OpenCV, to recognize the hand gesture and predict ASL letters.

Appointment Reservation System — *Nov 2022*

- Developed a reservation system for vaccination appointments using Microsoft Azure. Implemented a command line interface for users to schedule time slots for vaccinations.
- Connected the application to a database server created with a Microsoft Azure account. Utilized the application for patients and caregivers to track vaccine stock and appointments. (Skills: Microsoft Azure for database management)

Relevant Coursework

Courses Machine Learning, Computer Vision, Deep Robotic Learning, Applied Parallel Computing

Publications

Drop to Idle Test (DTIT)

SAE Mobilus

- Shankar R., ***Chauhan A.***, Krishnan N., and Chandrasekaran V., "Investigation of Temperature Distribution inside the Diesel Particulate Filter (DPF) during the Drop to Idle Test (DTIT) Performed at Steady-State and Worst-Case Driving Cycles," SAE Technical Paper 2021-01-0201, 2021