Hrishikesh Pawar

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Education

Worcester Polytechnic Institute — Worcester, MA
Master of Science in Robotics Engineering — *Aug 2023 - Aug 2025*
Selected Coursework: Deep Learning, Computer Vision, Vision-based Robot Manipulation

Savitribai Phule Pune University — Pune, India
Bachelor of Engineering in Mechanical Engineering — *Aug 2016 - Apr 2020*

Experience

- **Adagrad AI** | *Computer Vision Engineer* | *Pune, India* — *Nov 2020 - July 2023*

  Smart Lamps
  - Led a 4-member team in developing an AI/ML platform for smart lamps, enabling real-time fall detection for elderly care.
  - Designed a scene understanding system using **person detection, action recognition** and **pose estimation**.
  - Proposed and implemented a novel approach using single fisheye camera implementing a rotation-aware detection model.
  - Reduced memory consumption by **4x** which enabled the client to shift to low-compute devices reducing **40%** production cost.
  - Built continuous training, monitoring and deployment pipelines using Nvidia DALI, Triton, Docker, and AWS EC2.

  Gate-Guard | Indian Express | Times of India | YouTube
  - Developed an edge-based Boom Barrier Automation system using ALPR (Automatic License Plate Recognition)
  - Built data collection, training and deployment pipelines for lightweight object detection networks: YoloV4, YoloX.
  - Implemented data-augmentation techniques to enable color-invariant plate recognition, resulting in **20% mAP** improvement.
  - Designed interactive analytics and monitoring services using Django, Azure, WebSockets, Kafka, Celery and Redis.

  Customer Analytics for Retail Stores
  - Built an end-to-end edge web application to improve customer visibility, inventory management and staff optimization.
  - Developed data-collection pipelines using OpenCV, Flask and PostgreSQL to collect 40,000 images per day.
  - Managed Docker containers to ensure data security and portability across different hardware platforms.

Projects

- ***Zero-Shot Semantic Neural Style Transfer for Images*** | GitHub
  - Developed a Neural Style Transfer system for images, inspired by the paper AdaAttN.
  - Integrated AdaAttN with CLIPSeg for zero-shot style transfer, enabling prompt-based, text-driven image segmentation.
  - Improved style transfer adaptability, maintaining semantic integrity in diverse styles beyond traditional segmentation limits.
  - Tools used: PyTorch, CLIP, custom training and inference scripts.
- ***Multi-Object Grasp Point Detection from Object Top-Surface using RGB-D images*** | GitHub
  - Designed a grasp point detection system for a parallel jaw gripper using RGB-D images of the top surface of objects.
  - Applied PCL (Point Cloud Library) to preprocess and transform the point cloud data, facilitating accurate 3D analysis.
  - Developed an object geometry based heuristic algorithm for detecting the most stable grasping points.
  - Tools used: ROS2 Humble, Gazebo, Point Cloud Library, Open3D

Extracurricular Technical Leadership and Team Management Experience

- **Stallion Motorsport, Formula Student Team** | *Team Captain* | *Pune, India* — *Nov 2018 - Apr 2020*
  - Led a team of 56 members on international platforms of Formula Student Germany and Formula Student Austria.
  - Designed a subsystem to automate gear shifting of the racecar's power drive (Triumph Daytona 675R)
  - Led a team of 5 members in the development of the perception system for an Electric Autonomous racecar to accurately detect the location and colors of the environment landmarks using monocular cameras and Nvidia AGX Xavier platform.
  - Featured in several publications: Times of India | Formula Bharat | Formula Bharat

Skills

- **Languages**: Python, C/C++, SQL
- **Frameworks**: Pytorch, OpenCV, TensorFlow, ONNX, Numpy, Pandas, Django, Flask, Celery, Kafka, Matlab, CMake, CUDA, TensorRT, Docker, Git, ROS, ROS2w