SUMEET DUBE

Robotics | Machine Learning | Data Science
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EDUCATION

Savitribai Phule Pune University — D Y Patil College of Engineering
BE Robotics and Automation Engineering — *Nov-2022 - June-2025*
Minor: Data Science and visualization

Maharashtra State Board of Technical Education — Amrutvahini Polytechnic
Diploma Mechanical Engineering — *July-2019 - July 2022*
GPA: 8.2

EXPERIENCE

Larsen and Toubro | Apprentice — *Aug-2022 - Nov-2022*

- Led Assembly Integration and Testing of Electromechanical Actuators to ensure peak performance and functionality.
- Implemented Inventory Management strategies, optimizing tracking systems to enhance efficiency and accuracy while minimizing discrepancies.
- Directed Material Handling and Logistics operations, fostering seamless material flow and minimizing downtime.
- Played a key role in Vehicle Assembly processes, maintaining adherence to stringent quality standards and project timelines.

PROJECTS

Multiclass Image Classifier

Python, TensorFlow, NumPy, scikit-learn, Matplotlib

- Developed a multiclass image classifier on an open-source dataset using Python.
- Achieved an impressive training accuracy of 81% and validation accuracy of 84%.
- Implemented a Convolutional Neural Network (CNN) utilizing TensorFlow, significantly improving the model's accuracy and performance.
- Utilized advanced Data Augmentation techniques with scikit-learn to enrich the dataset's diversity and enhance model generalization.
- Leveraged NumPy for streamlined numerical computations and array manipulations, ensuring efficient data processing.
- Generated insightful visualizations of data and model performance using Matplotlib, facilitating comprehensive analysis and comprehension.

Object Detection using OpenCV:

Python, OpenCV

- Utilizes OpenCV alongside the YOLOv3 model for advanced object detection.
- Implemented in Python, the project efficiently preprocesses frames, detects objects, and overlays bounding boxes.
- Targets specified objects with confidence scores surpassing a predefined threshold.
- Supports seamless real-time video processing and file-based input for enhanced flexibility.

Web Scraping

Python, BeautifulSoup, Requests, NLTK

- Conducted web scraping operations using the Requests library in Python to collect data from diverse websites.
- Utilized BeautifulSoup (BS4) to extract and parse HTML content, facilitating streamlined data extraction.
- Employed the Natural Language Toolkit (NLTK) to tokenize and process text data, priming it for subsequent analysis.
- Conducted semantic analysis and text evaluation for Natural Language Processing (NLP) tasks, enhancing the depth and quality of insights derived from textual data.

Dobot Magician ROS2 Package

ROS2, Python, Linux, C++, TensorFlow, OpenCV

- Developed a ROS2 package for the Dobot Magician robotic arm, enabling efficient pick and place tasks and enhancing automation.
- Implemented multi-layer CNNs using TensorFlow to extract features, improving object recognition precision.
- Designed and trained a Deep Convolutional Neural Network (DCNN) for feature segmentation, enhancing task execution accuracy.
- Utilized OpenCV for image processing and computer vision tasks, optimizing object detection and interaction.
- Programmed the system with Python and C++ in a Linux environment, ensuring robust performance and compatibility with ROS2 frameworks.

Remote Controlled Mars Rover

Arduino Uno, C++, Android, Gyroscope

- Engineered a miniature rover inspired by the Perseverance Mars rover.
- Utilized an Arduino Uno to process inputs from an Android phone's gyroscope for remote control.
- Programmed custom C++ code in the Arduino IDE to enable seamless communication between the Android device and the rover.
- Developed a robust communication protocol for accurate and responsive data transmission from Android to rover.

3D Printed Robotic Arm

C++, ATmega 328, Servos, AutoCAD, Fusion 360

- Designed and constructed a small industrial robotic arm utilizing off-the-shelf servos for torque.
- Developed custom C++ code to control individual servos via ATmega 328-powered embedded hardware, ensuring precise movements and operations.
- Created detailed design blueprints of robotic arm components using AutoCAD.
- Generated realistic visualizations and simulations of the final designs with Fusion 360.

CERTIFICATIONS

Deep Learning (NPTEL) - Rank 1, Prof. Prabhir Kumar Biswas
Machine Learning Specialization (DeepLearning.AI | Stanford University)
Reinforcement Learning (NPTEL), Prof. Balram Ravindran
Python, Kaggle
Introduction to Machine Learning, Kaggle
Pandas, Kaggle

SKILLS

Programming Languages: Python, C/C++, BASH, Markdown, HTML, CSS
Libraries: TensorFlow, PyTorch, NumPy, Pandas, Matplotlib, scikit-learn, BeautifulSoup, HUGO
Platforms: Linux, ROS2, Arduino, Git, GitHub, VIM, Obsidian
CAD: AutoCAD, Fusion 360, Inventor, Tinkercad, FreeCAD
Productivity: Microsoft Office (Word, Excel, PowerPoint, OneNote)

HOBBIES AND ACHIEVEMENTS

MechFest 2022 - AV Poly

Rank 1: Paper Presentation Competition
Presented a paper on the ITER project

WINGS 2022 - Competition

Runner-up: Paper Presentation Competition
Presented a paper on the hyperloop

MONKEY TYPE - typing

Top speed 144 wpm

HACKERRANK - coding

5 start in C++

Hobbies: Reading, Gaming, Coding, Aviation

LANGUAGES

English
Marathi (मराठी)
Hindi (हिंदी)