UMANG SHAH

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EDUCATION

MS in Computer Science, University of Massachusetts - Boston - GPA 4.0/4.0 — Expected 2024
Relevant Coursework: Analysis of Algorithms, Neural Networks, Computer Vision.

MSc in Artificial Intelligence & Machine Learning, Gujarat University - GPA - 4.0/4.0 — 2018 - 2020
Relevant Coursework: Machine Learning, Deep Learning, Advanced Python.

Bachelor of Computer Application, Ahmedabad University - GPA - 3.97/4.0 — 2015 - 2018
Relevant Coursework: Data Structures and Algorithms, OOP, Advanced Database Management System.

SKILLS

- Python, Java
- Computer Vision
- MySQL, MongoDB
- Machine Learning
- Django, Flask
- Keras, PyTorch
- Pandas, NumPy
- OpenCV, SKLearn

EXPERIENCE

Research Assistant — May 2023 - Present
Visual Attention Laboratory, UMass Boston — *Boston, MA*

- Engineered a high-precision CNN model using Keras to significantly enhance facial recognition accuracy, leveraging the Biwi Head Pose Dataset to predict confidence for frontal and non frontal faces. Augmented the dataset to increase diversity. Decreased False positives by implementing the frontal face filter and increased recognition accuracy from 96% to 99%.
- Implemented a face orientation model using MobileNetV2 architecture which predicts confidence values for yaw, pitch and roll of a face.
- Utilized user votes to train a model that ranks various images of the same user based on face appearance and image quality, facilitating the automatic display of the best image for each user. This ranking system is also employed to select optimal images for the automatic retraining of the Facial Recognition Model.
- Streamlined inference efficiency and deployment readiness by converting the Keras model into an ONNX format, ensuring accelerated predictions and seamless integration into diverse systems.
- Researching on ways to speed up the training process and get robust object detections for YoloV8.
- Currently developing an Automatic Annotation Tool capable of detecting various objects within an image without necessitating specific object specifications. Leveraging Language-Image models (LLM), the tool identifies objects present in an image and utilizes GroundingDINO to generate bounding boxes for detected objects.

Software Engineer Intern — May 2023 - July 2023
Atsign Inc. — *Remote*

- Conceptualized and developed a Python SDK called at_python for building applications using the atProtocol.
- Ensured software integrity through the creation of comprehensive test cases.
- Utilized GitHub Actions to validate the SDK's compatibility across various Python versions.
- Crafted illustrative examples and documentation to facilitate user-friendly adoption of the SDK.

Associate Software Engineer — Jan 2020 - June 2022
GlobalVox Ventures Pvt. Ltd. — *Ahmedabad, India*

- Explored and implemented various Deep Learning and Machine Learning techniques for Facial Recognition.
- Architected a robust backend API system using Flask, orchestrated database schema design with MongoDB, and implemented rapid facial identification for over 100k faces within 2 seconds.
- Successfully developed a system using FER+ dataset for recognizing emotions, categorizing Angry, Sad, Happy, Disgust, Fear, and Surprise expressions with an accuracy of 73%.
- Designed an Indian Numberplate Detection system utilizing YOLO, achieving plate detection within 1 second.The system attained a commendable accuracy rate of 98%, leveraging a dataset sourced from real-world street scenarios.
- Played a key role in the entopedia.in project by developing APIs using Django Rest Framework, supporting a user base of over 10,000 individuals within Reckitt. Streamlined authentication with OKTA Single Sign-On, and incorporated PayPal & Stripe payment gateways, enhancing user experience by eliminating manual bank transfers.

PROJECTS

Person Re-identification. Re-identifying a person in an environment with multiple cameras using person detection, feature extraction and classification. For person detection, the FRCNN object detection network was used. The ResNet50 network was employed for feature extraction, and classification was based on calculating the Euclidean distance between extracted and stored features.

Finding Initial Centroids for K-Means Clustering. Research work under prof. Trushali Jambudi to identify initial centroids and speed up the convergence of K-Means algorithm.