Indraksha Agarwal

Deep Learning Engineer

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Summary

Experienced Deep Learning Engineer with **3+ years** of experience in developing, deploying and optimizing **computer vision** solutions. Strong background in creating custom models using deep learning algorithms and proficient in using frameworks such as **TensorFlow** and **PyTorch**.

Education

August 2016 - May 2020

Birla Institute of technology and science, Pilani - B.E. (Electrical and Electronics)

Relevant Courses: Machine Learning, Neural Networks, Image Recognition, Pattern Recognition, Object Oriented Programming, Operation Systems

Work Experience

Deep Learning Engineer: Reliance Jio Infocomm Limited - Navi Mumbai
August 2020 - Present

- **Facial Recognition**: Developed end-to-end solution for identifying the person by his face image for various use cases such as attendance capture, access control and blacklisting currently having **> 300k users** onboard.
  - Designed and Developed highly accurate end-to-end solution with a **False Acceptance Rate of <0.001%**
  - Worked in the development cycle of **patented automatic face registration** pipeline via CCTV camera.
  - Wrote Custom logic to reduce false acceptance rate by taking result aggregation of multiple frames.
  - Research and POC of multiple SOTA models for face detection and feature extraction
  - Optimized the inference time by converting the models to **TensorRT f**ormat and integrating on **Deepstream**, thereby increasing the camera density per GPU by **3x**
  - Creation of an **anti-spoofing** API designed to safeguard against fraudulent attempts, including mobile and print-based attacks.
  - Created the data collection and training pipeline to enhance the performance over time
  - Integrated with highly scalable and efficient feature vector querying database, **milvus**.
  - Secured a **granted patent** and one **published patent** related to this project, highlighting innovations in accuracy and security.

- **Footfall count**: A camera-based solution to generate insights on people movement and retail analytics. Currently deployed across more than 100 different locations with wide variety of field of view and people density.
  - **Led** the design and development of end-to-end solution with a people count accuracy of >98%.
  - Research and Performance comparison of multiple SOTA **detection and tracking** models to choose the best combination catering to our requirements.
  - Training the detection model with custom classes on our dataset to cater the missing detections for some observed edge cases thereby boosting the overall accuracy.
  - Developed an API capable of processing people's movement data to generate insightful visualizations like **heatmaps** and identify predominant pathways of movement using **clustering** and **image processing.**

- Identified performance bottlenecks and optimized the overall pipeline by converting the models to TensorRT and integrating the pipeline with DeepStream, achieving a significant **3.5x** increase in camera density per GPU.

- **Gesture Recognition:** Developed the gesture recognition solution to detect and recognize the gestures performed by users to capture their feedback
  - Trained the **YOLOv5** detection model on open source hand detection dataset
  - Increased hand detection accuracy by creating/training on relevant custom dataset using various augmentation techniques
  - Trained the **ResNet** model on detected crops to classify the gesture as required classes.
  - Deployed the solution API using **Triton Inference Server** and **Flask** for increased throughput.

Intern : IMI Mobile - Hyderabad
July 2019 - November 2019

- Dataset creation for training a chatbot handling banking related queries.
- Research on open source chatbot building API such as Dialogflow, Watson and Bot framework.
- Integrating the chatbot building platform APIs with our application to build custom chatbots for variety of requirements
- Creating basic CRUD Api for data insertion to chatbot platforms.

Technical Skills

- **Deep Learning:** Neural Network, TensorFlow, PyTorch, TensorRT, Deepstream, Triton Inference Server
- **Computer Vision:** OpenCV, Image Processing, Object Detection, Classification, Resnet, Yolo
- **Programming:** Python, Flask, Jupyter-Notebook, MySQL
- **Machine Learning:** Linear Regression, Random Forest, XGBoost, Clustering, A/B Testing
- **Miscellaneous:** Data Structure and Algorithms, Linux, Milvus, Docker, Kubernetes

Projects

- ML Hackathon: Predict Customer Value based on 10 parameters. Did EDA and pre-processing of data for extracting the relevant features, comparing regression models performance on test dataset such as XGBoost, Linear Regressor, KneighborsRegressor. Achieved top 200 position out of 8000 participants
- Kaggle Titanic Survival Prediction: Project to classify whether a given person will survive or not titanic disaster based on provided features. EDA and preprocessing of data. Testing and comparing the performance of multiple classification models on a test dataset.
- Virtual Drawing : Python program that displays what you are writing virtually by index finger using hand landmark detection and tracking