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Yashasvi Baweja

Machine Learning Engineer

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Focused software developer with hands-on experience in designing, enhancing and maintaining Python web applications & microservices on AWS cloud. Adept at building, training & deploying large scale machine learning models in PyTorch. Works well with teams and have experience owning end-to-end deliverables individually

Education

Johns Hopkins University (JHU) GPA: 3.9/4.0 — Baltimore, MD
Master of Science (M.S) - *Electrical & Computer Engineering* — 2019 - 2022

Indraprastha Institute of Information Technology (IIITD) GPA: 8.31/10.0 — Delhi, India
Bachelor of Technology (B.Tech) - *Computer Science & Engineering* — 2015 - 2019

Skills

Programming Languages
- Python, Bash
- Java, SQL
- C/C++

Databases
- MySQL, PostgreSQL
- MongoDB
- DynamoDB(NoSQL)
- AWS RDS, S3

Frameworks
- Flask, Django
- Docker, Postman
- VSCode, Debugger
- Git

Cloud(AWS)
- Lambda(Serverless)
- CloudWatch
- Amplify
- CloudFormation

Machine Learning
- PyTorch, Tensorflow
- NumPy, Pandas
- OpenCV, Pillow
- Jupyter, Scikit-learn

Experience

Python Developer / Data Platforms — **Sep 2022 — Present**
CalaHealth Inc — *Baltimore (Remote)*

- Built a new microservice in patient portal which improved securing the registration workflow
  - Deployed a serverless function in ***AWS Lambda*** to sync new user data from Salesforce in ***DynamoDB***
  - Utilized ***jwt token*** to verify signature in API to improve upon previous un-authenticated routine
- Created a REST API routine to assist research team in analysing logs
  - Spin up an ***AWS EC2*** instance to run a ***Flask*** app accepting logs from device base station(s)
  - Improved security of server by manually setting ***iptables*** to allow only tcp connections on specific port
- Ideated and developed RESTful microservices for the Health Care Personnel (HCP) dashboard
  - Demonstrated the importance of HCP portal by building individual microservices in ***Docker***
- Provided support to implement multiple APIs & fixing bugs reported in other microservices written in ***Python***

MLE Intern / Model deployment — **May 2022 — Sep 2022**
RIG Group Inc. — *Baltimore, MD*

- Led the team discussions to architect and train a deep learning model to detect chest disease(s) in x-ray
- Helped translate technical results directly to the upper management by writing easy-to-read code in ***Jupyter(Google Colab)***
  - Utilized expertise in ***PyTorch*** to train model on NIH chest x-ray dataset
  - Built confidence in model predictions by performing 5-fold cross validation with ***90%+*** mean accuracy
- Took lead initiative to build an application from research idea by puting the trained model on cloud
  - Deployed the trained model on ***AWS EC2*** using ***Flask*** micro-framework
  - Created ***AWS APIGateWay*** to allow connections to EC2 on specific port from the web

Researcher / Face Anti-Spoofing — **Aug 2019 — May 2021**
Vision(ECE) Lab, JHU — *Baltimore, MD*

- Addressed challenge of detecting spoofs in face authentication videos using anomaly detection
  - Proposed a training framework with only real face data while detecting spoofs as anomalies
  - Reduced latency in algorithm by selecting only one image per 30 frames using ***OpenCV***
  - Handled class imbalance in data by penalizing errors arising from under-sampled class
- *Published research at IJCB, 2020*
  - Received award for top 3 technical presentations

Publications

1. **Anomaly detection-based unknown face presentation attack detection**, **Y. Baweja**, P. Oza, P. Perera & V. M. Patel; at *International Joint Conference on Biometrics(IJCB), 2020*
2. **Heterogeneity aware deep embedding for mobile periocular recognition**, R. Garg*, **Y. Baweja***, S. Ghosh, R. Singh, M. Vatsa & N. Ratha; at *Biometrics: Theory, Applications and Systems(BTAS), 2018*
3. **Comparison of Class Imbalance Techniques for Real-World Landslide Predictions**, K. Agrawal, **Y. Baweja**, (+8 authors) & V. Dutt; at *International Conference on Machine Learning and Data Science(ICLMDS), 2017*

Projects

Restaurant Hygeine classifier
JHU *Baltimore, MD*

- Analysed 2021 data from Open Portal to find the best restaurants in San Francisco based on hygiene
  - Perform feature engineering on columns like business-location, zipcode, inspection score to find best features
  - Compared Random Forest, Decision Tree, Neural Network, k-NN & SVM classifier over 10-fold cross validation
- Gained insights that location alone is not a good predictor for hygiene

Voice2Face
JHU *Baltimore, MD*

- Using Generative Adversarial Networks to create emotionally aware faces from voices
  - Implemented the paper "*Reconstructing faces from voices, Wen et. al*" in PyTorch
  - Added new auxiliary network which handles emotion along with speech signals

Periocular Recognition
IIITD *New Delhi, India*

- Developed a novel loss for training CNNs in presence of data from different modalities
- Extended Triplet Loss by adding two branches(spectrum/resolution) to account for heterogeneity
- *Published research at BTAS, 2018*
  - Achieved State-of-the-art(10% improvement in EER) for periocular recognition

Smart Glasses
IIITD *New Delhi, India*

- Created a Raspberry Pie based headset to aid visually challenged in reading text by using Tesseract OCR
- Wrote scripts to integrate text-to-speech software like eSpeak for the output produced from OCR

Landslide Prediction System
Indian Institute of Technology *Mandi, India*

- Designed and assembled an Arduino based landslide prediction architecture
- Coded in C to periodically record sensor data like humidity, elevation & moisture
  - Configured a GSM module with the micro-controller to send site data to cloud

Activities & Awards

- Recipient of 2019 Graduate Student Fellowship, ECE department, JHU
- Student mentor for Intl Conference: CVPR, 2022 (New Orleans, Louisana)
- Project Showcase finalist (Smart Glasses), Mini-Maker Fair @ IIITD
- Reviewer for IEEE Transactions Journal on Image Processing, 2022
- Top 3 awardee for best presentation at IJCB, 2020
- Honors student (Grade 12) - Recipient of national recognition letter for academic performance

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