ASHWIN UNNIKRISHNAN

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EDUCATION

Northeastern University, Khoury College of Computer Sciences *Boston, MA*
Master of Science in Artificial Intelligence (GPA – 3.95/4.0) Dec 2023
Teaching Assistant: Algorithms (Graduate Course)
Related courses: Machine Learning, Artificial Intelligence, Computer Vision, Deep Learning, Natural Language Processing (NLP), AI for Human-Computer Interaction(HCI), Design Patterns, Algorithms

National Institute of Technology *Warangal, India*
Master of Technology in Computer Science and Information Security (GPA – 3.5/4)

TECHNICAL KNOWLEDGE

Languages : Python, Java, C++, Javascript, Shell Scripting, Perl, Kotlin, GraphQL, SQL, Vector Database (Pinecone, Redis)
Libraries : TensorFlow, Scikit-Learn, Pandas, Numpy, XGBoost, spaCy, Matplotlib, Seaborn, OpenCV, Plotly, PIL, MLflow
Frameworks : BigQuery, PySpark, AWS, Kubernetes, Databricks, GitHub, PyTorch, PyCaret, JIRA, Dockers, Azure, JAX
Domains : Computer Vision, Neural Networks, Reinforcement Learning, Generative Adversarial Networks(GANs), Image Detection and Segmentation, LLM, Recommendation Systems, MLOps, A/B Testing, Collabrative Filtering

WORK EXPERIENCE

Raysecur Inc. Boston, USA Jan 2023 - Aug 2023
Machine Learning Engineer (Co-op)
(*AWS [Rekognition, S3, Lambda, Sagemaker], OpenCV, Jupyter Notebook, tfjs-node, SQL, Python, Javascript, GitHub, CUDA*)

- Engineered and deployed robust image classification models utilizing the MobileNet architecture for terahertz imaging focused on threat detection in mail security and successfully transitioned the flagship product's inaugural classification model into production.
- Conducted extensive research and exploratory data analysis on terahertz imaging techniques, effectively integrating them into the model design process by normalization and histogram stretching helped improve accuracy of model by 12%.
- Developed an end-to-end automated CI/CD pipeline for use case-specific dataset generation, model training, and detailed reporting on optimal hyperparameters, resulting in a 60% reduction in time as part of an NSF grant.
- Implemented AWS Lambda functions to merge images from diverse data sources, streamlining dataset generation and threat item-oriented database management, dataset merging and maintenance time was reduced by 20%.
- Investigated potential of using Generative Adversarial Networks(GANs) and Diffuser models to create synthetic terahertz images.
- Developed an Optical Character Recognition model for reading mail addresses and flagging spam mailing addresses.

Qualcomm | Hyderabad, India July 2017 - Feb 2021
Senior Software Engineer
(Python, Perl, Kotlin, Shell Scripting, C#, Junit Testing, XML, GitHub, Jenkins, Jira, Jupyter Notebook, C++, Linux, Beautiful Soup)

- Led a team of seven engineers within the IoT Stability group, overseeing stability testing for Qualcomm-delivered IoT chipsets. Collaborated with cross-functional teams to develop and implement production plans.
- Engineered organization specific chatbot seamlessly integrated with Skype. Utilized dynamic model training for limited data. Employed TF-IDF with cosine similarity for precise query matching, helped improve user experience saving **30%** time.
- Developed and trained a sentiment analysis model to analyze customer reviews scraped from various websites, enhancing the quality of test cases in production and ensuring comprehensive bug detection prior to deployment.
- Created Auto Code Maintenance tool utilizing Q-learning technique to upkeep the stability testing UI code for wearables, reducing time needed for manual code maintenance by **70%**.
- Devised robotic arm employing stepper motors and microcontrollers to replicate running, walking, and swimming actions, enhancing the effectiveness of testing, resulting in cost savings of **$40,000**.
- Managed IoT testing automation development(stability, platform, OTA) using agile methodology, played a key role in Python framework transition from Perl scripts, and earned the Q-star award for exceptional leadership and rapid, effective implementation.

PROJECTS & RESEARCH PAPERS

Social Media Profile Classifier (*Northeastern University)*

- Applied transfer learning by retraining MobileNet pretrained on the MS COCO dataset, for custom segmentation of data collected.
- Constructed profiles by merging objects from images, employed Logistic Regression with TF-IDF for profile classification.
- Conducted A/B testing, one group used randomized classifications and system-developed classifications for the other group.

Facial Emotion Recognition (*Northeastern University)*

- Using Synthetic Minority Oversampling, Data Augmentation and GANs to generate synthetic data, dataset was balanced.
- Applied transfer learning with ResNet-9 and VGG-19 pre-trained models, evaluating performance using AUC and F1 score.
- Created a Flask web application using best model, containerized it with Docker, and deployed the optimal model on Heroku.

Emotalk: Sentiment Analysis on Audio Text Data (*Northeastern University)*

- Addressed data imbalance via oversampling and used SpaCy embeddings for vectorization. Customized and fine-tuned neural networks (LSTM, BERT, DistilBERT, RoBERTa) and XGBoost on Twitter data using transfer learning, for custom dataset.
- Utilized GridSearchCV for XGBoost and Optuna for transformers to optimize hyperparameters.