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Divya Appapogu

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Education

Boston University **Boston, MA** **Aug 2021 – Jan2023**

- **M.S. in Artificial Intelligence, GPA: 3.93/4.0**
- **Coursework:** Machine Learning, Deep Learning, Image Video Computing, Natural Language Processing, Artificial Intelligence, Graduate Algorithms.

IIT Hyderabad **Hyderabad, India** **Aug 2015 – May 2019**

- Bachelor of Technology in Engineering Science(with focus on Computer Science)
- **Coursework:** Data Mining, Information Retrieval, Practical Challenges in Image Analysis, Bayesian Data Analysis, Computer Networks and Hardware Security, Advanced Data Structures and Algorithms, Discrete Structures, Compilers, Software Engineering, Advanced Machine Learning.

Research Publications

Conference Proceedings **Jan 2022 - Nov 2023**

MIMIC (Submitted to CVPR'24) D. Appapogu, K. Nichols, G. Biamby, A. Rohrbach, B. Plummer, "MIMIC: Multimodal Image Manipulation with Rich Context," submitted to Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), 2024.

Jan 2018 - Feb 2019

Identification of Mixed Retinal Cells using DBSCAN [PAPER] D. Spoorthy, S. R. Manne, V. Dhyani, et al., "Automatic identification of mixed retinal cells in time-lapse fluorescent microscopy images using high-dimensional dbscan," in 2019 41st Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC), 2019, pp. 4783–4786. doi: 10.1109/EMBC.2019.8857375

Research Experience and Projects

May 2022 - October 2022

Synthetic Media Attribution [REPORT] Collaborated with Dr. Kate Saenko and Dr. Bryan Plummer on a research project focused on developing a classifier for attributing synthetic (Diffusion and GAN generated) images to their respective generators.

- Designed and Implemented a ResNet-18-based multi-headed classifier, which utilized adversarial strategies to mitigate model reliance on subclass-related features, aiming to improve robustness and subclass-agnostic performance.
- Created a dataset with 70k images consisting of synthetic images generated by 6 different Diffusion and GAN based generative models.
- Our final model was submitted for the SemEval competition in summer 2022, conducted by DARPA, where our classifier was one of the top performers for 4/6 generative models.

Feb 2022 - May 2022

Manipulating Stochastic Gradient Descent with Data Ordering Attacks [REPORT] In this project, we implemented data ordering attacks for ML models taking advantage of stochasticity of SGD and the fact that order of data influences training procedure.

- We use various CNN and Transformer (extending upto existing work) based models like LeNet, ResNet18, ResNet50, ViT-b-16.
- We introduced attacks like Batch reordering, Batch reshuffling and Backdoor attacks where a surrogate model is trained simultaneously with a source model to reorder the data points wrt the losses or gradients.

Oct 2021 - Jan 2022

Multilingual Emoji Prediction [REPORT]Multiple Transformer based models have been fine-tuned on the English and Spanish tweets and the resulting experiment outperformed the baseline of SemEval Competitionin terms of overall accuracy.

Feb 2022 - May 2022

COVID-19 Instagram posts emotion detection [REPORT] Emotion Detection on Instagram posts using **Sentiment140 dataset**. Used BERT fine tuned model to train on training data of twitter. Used BERT(small) with Adam optimizer and obtained accuracy upto 72 - 74 percentage.

Experience

Software Engineer **Barclays** **Feb 2023 - Current**

- Responsible for designing, developing, and maintaining cutting-edge backend systems using Spring Boot, Java, MongoDB, Kafka, and other technologies for innovative financial applications.
- Worked with Docker and OpenShift to leverage containerization and orchestration, enabling efficient application deployment and scaling, following DevOps methodologies to deliver high-quality, performant code with continuous integration and automated deployment processes.

Software Development Engineer II **OYO** **June 2019 - Aug 2021**

- Designed and implemented new micro services breaking the monolith traum service (legacy system) which enabled better scalability, maintenance and efficiency.
- Developed a search feature for retrieval of marketing information and implemented a caching algorithm to improve its performance.
- Designed a big data architecture to queue and manage time consuming tasks on distributed clusters using Kafka.
- Worked to build a more maintainable alternative to a complex architecture and implemented safe interfaces to migrate large scale production data stored using it.

Skills

- **Machine Learning**:
  - Numpy, OpenCV, PyTorch, TensorFlow, Keras, Scikit-Learn for building and deploying machine learning models.
  - Good understanding of Deep Learning, Computer Vision, NLP, Probability and Statistics theory
  - Experience in generating large scale datasets using state of the art Generaive AI models (some of my work can be found on my website).
  - Experienced in NLP libraries and frameworks such as NLTK, Gensim, spaCy, and TextBlob.
  - Able to work on tasks like sentiment analysis, text classification, and language generation.
- **Research Skills:**
  - Foundation in research methodologies, literature review, and experimental design.
  - Experience in conducting experiments, analyzing results, drawing meaningful conclusions and writing Research Papers.
- **Data Analysis and Manipulation:**
  - Skilled in data preprocessing, feature engineering, and data visualization using Pandas, Matplotlib, Seaborn, and Plotly.
  - Experienced in data modeling, regression, clustering, and classification.
  - Jupyter Notebook for interactive data analysis and experimentation.
  - Familiar with Git for version control and collaboration.
  - Experience with Docker for containerization and Kubernetes for orchestration.
- **Programming Languages:**
  - Proficient in Python for research, scripting, and data analysis.
  - Familiar with C++, Java, and other languages for broader software development.