SAHANA SUBRAMANYA KOWSHIK

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EDUCATION

Boston University | **Boston, MA** September 2023 – Present

Doctor of Philosophy in Computing & Data Sciences

- **Coursework**: Mathematical Statistics

Boston University | **Boston, MA** January 2023

Master of Science in Computer Science **CGPA**: 3.93/4.0

- **Coursework**: Graduate Algorithms, Computational tools for data science, Object-oriented Software Principles and Design in Java, Machine learning, Natural Language Processing, Image and Video Computing, Deep Learning, User-centric Systems for Data Science

RV College of Engineering | **Bengaluru, Karnataka, India** August 2021

Bachelor of Engineering in Electronics and Communication Engineering **CGPA**: 9.09/10.0

- **Coursework**: Object oriented programming and Data structures using C++, Graph theory, DBMS, High performance computing, Linear algebra, and probability theory, Applied partial differential equations, Discrete and integral transforms, Advanced linear algebra, Computer communication networks

SKILLS

- **Programming Languages**: Python, C++, Java, SQL, Shell Scripting
- **Machine learning libraries**: Keras, Tensorflow, PyTorch, NLTK, HuggingFace, gensim, Spacy, OpenCV, Numpy, Pandas, Scikit-Learn, Matplotlib, spaCy, Beautiful Soup, NetworkX
- **Technologies/Frameworks**: Git, Linux, Jenkins, Docker, Ray, Java Swing

RESEARCH EXPERIENCE

Boston University, Kolachalama Laboratory February 2023 – Present

Research Fellow Boston, MA

- Utilizing Python's pandas and sklearn libraries to efficiently process large volumes of non-imaging data from various cohorts to create a master dataset for training the model
- Working on developing an end to end transformer based pipeline for identifying different dementia etiologies using brain scan MRI and non-imaging data
- Researching ways to improve the model performance by experimenting with different loss functions and utilizing different strategies to tackle the class imbalance problem

BU Spark February 2022 – December 2022

Machine Learning intern (Part-time) Boston, MA

- Built a reliable machine learning framework using BERT backbone to recognize the semantic difference between mentions of race vs. mentions of color in non-racial terms in the media articles
- Extracted racial keywords from a sentence using attention analysis of the trained model's hidden layers

INDUSTRY EXPERIENCE

Mentor Graphics January 2021 – June 2021

Embedded software development and QA intern Bengaluru, India

- Worked on development and testing of embedded Linux Flex operating system
- Automated the process of embedded testing using Unix test scripts and CI/CD tools like Jenkins and LAVA

PROJECTS

Visually Perspective Similarity Metric for Text-to-Image Models
September 2022 – December 2022

- Formulated a robust similarity metric based on L2 norm, cosine similarity, and inception score to quantify the similarity and variance between the images generated by Stable Diffusion and Dall-E2 text-to-image models when there are perturbations in the text prompts
- Demonstrated that despite visual differences, the images generated by these models for the same and modified prompts exhibit very high similarity scores

Multilingual emoji prediction
March 2022 – May 2022

- Fine-tuned various state-of-the-art discriminative and autoregressive language models such as multiBERT, XLM-Roberta, mDeBERTa, GPT-2, DistilGPT-2, and GPT-Neo to accurately predict emojis for English and Spanish tweets
- The results outperformed the baseline set in the SemEval Competition-2018

Visual Odometry
March 2022 – May 2022

- Designed an algorithm to track the path of the camera using information from the frames of a video
- Features from the video frames are detected using the FAST feature detector and the optical flow is estimated using Lucas–Kanade algorithm. By calculating the essential matrix and recovering the camera poses from it, the trajectory of the camera is estimated

Bank ATM application
October 2021 – December 2021

- Designed and developed a fully functional desktop bank application with the following features: create a checking or savings account, transfer money, request for a loan from the bank, and also trade in stocks
- Followed an object-oriented design structure and used factory and singleton design patterns to design the Java classes
- Business logic is implemented in Java core and leveraged SQLite to store user data. The front end of the application is developed using Java Swing

ACHIEVEMENTS & PUBLICATIONS

- Won silver tier in the **3rd NeurIPS 2022 Neural MMO challenge** on Learning to Specialize in Massively Multiagent Open Worlds
- **Grace Hopper Celebration Conference Scholarship 2022**, Boston University
- Sahana K S, Maanas M D, M Govinda Raju, **Test Automation Framework for Embedded Linux Testing**, Journal of University of Shanghai for Science and Technology Volume 23, Issue 6, June - 2021, page 633-639
- Anmol Bhat, Rakshata Karlingannavar, Sahana K S, **Telemetry system using BeagleBone Black**, Imperial International Journal of Eco-Friendly Technologies (IIJET) Vol.3, Issue – 1 (2018), pp. 23-27