Karthik Viswanathan

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Website – Github – LinkedIn

Experience

Winter Researcher — **Chennai**
SENAI, IIT-Madras — *Dec 2020 - Jan 2021*

Implementation of thermal occupancy estimation using tripwire based configuration of thermal sensors done optimally using minimal libraries. Implemented background subtraction techniques using Markov Random Fields and performed careful mappings between two different frames and handled lingering cases. Advised by Prof. Raghunathan Rengaswamy. Achieved an accuracy of 80-90 percentage in high-activity areas and 100 percentage in areas with normal activities.

Platform Developer — **Geneva**
AIcrowd — *Jun 2020 - Aug 2020*

Worked under the supervision of Prof. Marcel Salathe and Sharadha Mohanty, EPFL and collaborated with reputation ranking team, the automation team (Create your own Grader), and the Ruby on Rails team. Fixed bugs involved in graphs and asynchronous jobs. Carefully migrated 20 attributes from on relation to the other with uttermost care. Implemented Paper trail versioning and sidekiqized jobs. Involved in AI-challenge grader automation and created documentations for the Flatland challenge.

Research Intern — **Hyderabad**
Software Engineering Research Center, IIIT-H — *Feb 2020 - July 2020*

Worked with Prof. Raghu Reddy on a project funded by Department of Science and Technology, Government of India. The project involved created scalable and extensible deep-web crawlers from scratch. We used an innovative deep web crawling algorithm which involved Q-Learning (RL) in order to extract documents from the web, index them and use binding queries to crawl through further resources. Involved in using results from a semantic search engine in order to classify high-security mails.

Software Engineering Research Center, IIIT-H — **Hyderabad**
Course Designer, Introduction to Software Systems — *June 2020*

Education

Academic Qualifications

B.Tech. in Computer Science and M.S. by research in CNS — **2019 - 2024**
IIIT-Hyderabad, Hyderabad — *8.8/10*

Mentee (QIT) — **2021**
IBM Quantum, Selected to get mentored by Oxford and MIT Researchers

High School — **2017 - 2019**
Asian International Private School, Ruwais — *97.8 %*

Academic Projects

- **Genesis :** *"Extensible Genetic Algorithm library in Python"*

  Genetic Algorithms(GAs) were inspired by the Charles Darwin theory of natural selection and we have added functionalities for a continuous GA solver and used it to optimize the traveling salesman problem (TSP), approximate the minimal roots of a non-linear equation and feature selection in the field of Machine Learning.

- **HCDBMS :** *"Hotel Chain Database Management System"*

  HCDBMS is an administrator side Hotel Chain database management system made as a part of CS4.301 Data and Applications, Monsoon 2020. The project had phases like ER Diagram creation, Normalization and CLI coding phase. Extensive cascading, update and user privacy has been achieved in this project.

- **Bone-2D :***'Bone-extraction using UNets'*

  The process involves converting a 3-D X-Ray (CXR) into Digitally Reconstructed Radiographs (DRR) using Computer Vision. Previous works on this domain used FCNNs and L1 Loss for calculating the predicted DRR. This method proposes a new model: a trainable UNET and a non-trainable VGG19 network (in order to calculate perpetual loss using the conv3d outputs)..

- **MLC++ :***'Emulator for Unsupervised clustering algorithms and PCA'*

  The MLC++ is a collection of C++ Emulators for unsupervised clustering algorithms. The algorithms coded are KNN clustering , DBSCAN clustering and PCA reduction with optimised space and time complexity. The objective of this project is to get a deeper understanding and working of each of the above mentioned algorithm. Work is in progress. The project uses file handling as a method to store data. Programs have been segmented into modular files in order to have an easier workflow.

- **UPGMA :***'Phylogenetic Relationship calculator'*

  Agglomerative Clustering performed from scratch using Numpy given the neucleotide and protein alignments.

Skills

- **Programming Languages:** C, C++, Java, Python, R, MatLab (Strong DSA background)
- **Tools and Frameworks:** Pytorch, Keras, Tensorflow, Scikit-Learn, MySQL, Git, Azure ML, AWS

Achievements

- Neuromatch Abstract acceptance (3-D Reconstruction of fMRI vox2pix images using GANS)
- Dean's List in Monsoon-2020 semester with perfect 10 GPA
- CBSE Middle east topper and EMEA Rank-1
- Gold Medal and Top-15 International Rank in National Cyber Olympiad (SOF)
- EMEA Rank-1 in ICAS, an exam conducted by UNSW-Australia.
- Open Data Science Community Scholarship awardee
- IMO EMEA Rank-1 and NGSE Top 50 among 20,000 participants.