SUMUKH AITHAL K

Bengaluru, India

Email: sumukhaithal6@gmail.com Website: sumukhaithal6.github.io

EDUCATION

PES University, Bengaluru *August 2018 - Present*
Bachelor of Technology CGPA : 9.82/10
Department of Computer Science and Engineering
Relevant Coursework: Machine Intelligence, Topics in Deep Learning, Big Data, Linear Algebra, Practical Reinforcement Learning, Advanced Algorithms

RESEARCH & WORK EXPERIENCE

Video Analytics Lab, Indian Institute of Science May 2020 - Present
Research Intern *Bengaluru, India*

- Working on a research project on Active Domain Adaptation under Prof. R Venkatesh Babu.
- Developed a novel active learning strategy to select the most informative samples from the unlabeled target set for domain adaptation. The project was accepted at ICCV 2021.

Microsoft Innovation Lab, PES University June 2019 - July 2019
Project Intern *Bengaluru, India*

- Developed a Customer Feedback Analysis Model to analyze the customer review data of a company, and help identify critical issues based on their severity and impact on customers and management.
- Performed Aspect Based Sentiment Analysis on the reviews to categorize the reviews and understand the customer's sentiment.

PUBLICATIONS **(* indicates equal contribution)**

S^{3}VAADA: Submodular Subset Selection for Virtual Adversarial Active Domain Adaptation
Harsh Rangwani, Arihant Jain*, **Sumukh K Aithal***, R. Venkatesh Babu
*In International Conference on Computer Vision (**ICCV**) 2021.* [Project Page]

Robustness to Augmentations as a Generalization metric [Paper] [Video] [Code]
Sumukh Aithal K*, Dhruva Kashyap*, Natarajan Subramanyam
1st Runner Up in Predicting Generalization in Deep Learning, NeurIPS 2020 Competition Track

Developed a simple yet effective method to predict the generalization performance of a model based on the idea that models that are robust to augmentations are more generalizable than those that are not.

Methods and Analysis of The First Competition in Predicting Generalization of Deep Learning [Paper]
Yiding Jiang, Parth Natekar, Manik Sharma, **Sumukh K Aithal**, Dhruva Kashyap, Natarajan Subramanyam, Carlos Lassance, Daniel M. Roy, Gintare Karolina Dziugaite, Suriya Gunasekar, Isabelle Guyon, Pierre Foret, Scott Yak, Hossein Mobahi, Behnam Neyshabur, Samy Bengio;
***Proceedings of the NeurIPS 2020 Competition and Demonstration Track, PMLR** 133:170-190*

Domain Shift in Capsule Networks [Paper]
Rajath S*, **Sumukh Aithal K***, Natarajan Subramanyam
In 10th International Conference on Pattern Recognition Applications and Methods (ICPRAM) 2021
In this paper, we analyze how well capsule networks adapt to new domains by experimenting with multiple routing algorithms and comparing them with CNN's.

Transfer Learning Using Neural Ordinary Differential Equations [Paper]
Rajath S, **Sumukh Aithal K**, Natarajan Subramanyam
A concept of using Neural Ordinary Differential Equation for Transfer Learning has been introduced. It has been shown that the proposed method shows stability during training in transfer learning tasks.

TECHNICAL SKILLS

Machine Learning	PyTorch, Keras, Tensorflow, OpenCV
Programming Languages & Tools	Python, C, C++

PROJECTS

Low Light Object Detection (Intel Advanced Driver Assistance Systems Project)
Performed Semantic Segmentation on the Indian Driving Dataset using custom trained DeepLabV3+ network. Worked on low light enhancement techniques to improve the model's accuracy.
Kaggle's ALASKA2 Image Steganalysis: Developed a Custom EfficientNet model to detect hidden data within images. Won a Silver medal for being in the Top 3% (32/1095) of all teams.
Imitation Learning on Enduro: Trained an agent to play the game of Enduro using Imitation Learning on the OpenAI gym environment. [Code].
Generic B+ Tree: B+ Tree data structure for generic types. Supports all features of Standard Template Library (STL) container. [Code]
India Police Hackathon: Designed an Open Source Intelligence tool for the Karnataka police to get the Online Presence Matrix of an individual who may be a suspect, criminal or foreign agent.

ACHIEVEMENTS

Kaggle Competition Expert: Ranked among top 2% of Kaggle participants. [Link]
CNR Rao Scholarship: Awarded to top 2% of the students at PES University. 2018-2021
India Police Hackathon: Among the top 8 out of 500 teams. November 2019
Rakathon 2.0: Among the top 30 out of 1750 teams. November 2019
Bounce Hack 1.0: Among the top 25 out of 2000 teams. August 2019
Intel - PESU Student Contest: Awarded Best Completed Submission among 70 teams for the project on low light object detection. May 2019
Pravega IBM Hackathon, Indian Institute of Science: Top 10 out of 100 teams. January 2019
Karnataka Common Entrance Test: Rank 383 out of 0.2 million students. April 2018

OTHER EXPERIENCE

Problem Setter and Reviewer for The AlCoding Club, the algorithms and coding club at PES University.

Organized a Machine Learning workshop at the The Amateur Scientist, a science and technology event for high-school students.

Attended Eastern European Machine Learning (EEML) Summer School in 2021.

Attended CIFAR Deep Learning + Reinforcement Learning (DLRL) Summer School in 2021.

Volunteered for the project at Mila titled "COVI Canada: Peer-to-peer AI-based tracing of COVID-19".