

# SUMUKH K AITHAL

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## EDUCATION

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**Carnegie Mellon University** 2023 -  
Masters of Science in Machine Learning

**PES University, Bengaluru** 2018 - 2022  
Bachelor of Technology in Computer Science and Engineering CGPA : 9.83/10  
*Relevant Coursework:* Machine Intelligence, Topics in Deep Learning, Big Data, Top 1%  
Linear Algebra, Practical Reinforcement Learning, Advanced Algorithms

## RESEARCH & WORK EXPERIENCE

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- Fujitsu Research India** Sept 2022 - Apr 2023  
*Applied Researcher II* Bengaluru, India
- Worked on topics in Graph Neural Networks and Self-Supervised learning on small scale datasets.
- Mila - Quebec AI Institute** May 2022 - Oct 2022  
*Research Intern* Remote  
*Advisor: Prof. Yoshua Bengio and Anirudh Goyal*
- Worked on Self-Supervised Learning in close collaboration with Alex Lamb and Michael Mozer.
- Video Analytics Lab, Indian Institute of Science** May 2020 - May 2022  
*Research Intern* Bengaluru, India  
*Advisor: Prof. R Venkatesh Babu*
- Worked on Long-Tailed Learning (NeurIPS 2022), Domain Adaptation (ICML 2022) and Active Domain Adaptation (ICCV 2021).

## SELECTED PUBLICATIONS

(\* indicates equal contribution)

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**Leveraging the Third Dimension in Contrastive Learning**  
Sumukh K Aithal, Anirudh Goyal, Alex Lamb, Yoshua Bengio, Michael Mozer  
Accepted in *NeurIPS 2022 Workshop: Self-Supervised Learning - Theory and Practice* [Paper]

**Escaping Saddle Points for Effective Generalization on Class-Imbalanced Data**  
Harsh Rangwani\*, Sumukh K Aithal\*, Mayank Mishra, R. Venkatesh Babu  
In *Neural Information Processing Systems (NeurIPS) 2022*. [Paper] [Code]

**A Closer Look at Smoothness in Domain Adversarial Training**  
Harsh Rangwani\*, Sumukh K Aithal\*, Mayank Mishra, Arihant Jain, R. Venkatesh Babu  
In *International Conference on Machine Learning (ICML) 2022*. [Paper] [Code]

**Towards Domain Adversarial Methods to Mitigate Texture Bias**  
Dhruva Kashyap\*, Sumukh K Aithal\*, Rakshith C\*, Natarajan Subramanyam  
Accepted in *Principles of Distribution Shift (PODS) Workshop at ICML 2022 & Workshop on Spurious Correlations, Invariance, and Stability (ICML) 2022*. [Paper]

**S<sup>3</sup>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*

**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*

## TECHNICAL SKILLS

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**Machine Learning**

PyTorch, Keras, Tensorflow, OpenCV

**Programming Languages & Tools**

Python, C, C++

## PROJECTS

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**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](#)].

**Contributed to torchvision library:** Added support for German Traffic Sign Recognition Benchmark (GTSRB) Dataset in torchvision (11k+ stars) library. [[Link](#)]

**Generic B+ Tree:** B+ Tree data structure for generic types. Supports all features of Standard Template Library (STL) container. [[Code](#)]

## ACHIEVEMENTS

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**Award for Academic Excellence, PES University:** Ranked 6th in the Computer Science department for my academic standing out of 975 students.

Sept 2022

**Kaggle Competition Expert:** Ranked among top 2% of Kaggle participants.

[[Profile](#)]

**CNR Rao Scholarship:** Awarded to top 1% of the students at PES University.

2018-2022

**Intel - PESU Student Contest:** Awarded Best Completed Submission among 70 teams for the project on low light object detection.

May 2019

**Karnataka Common Entrance Test:** Rank 383 out of 0.2 million students.

April 2018

## OTHER EXPERIENCE

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- **Reviewer:** ICML 2022, 2023, NeurIPS 2022, 2023. ICCV 2023, ICLR 2024.
- Problem Setter for The AICoding Club, the algorithms and coding club at PES University.
- Attended "Research Week with Google" 2022 organized by Google Research India.
- 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: "COVI Canada: Peer-to-peer AI-based tracing of COVID-19".