

# Kaushal Bhogale

<http://kaushalbhogale.in>

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## EDUCATION

M.Tech in Computational and Data Sciences  
(2019-2021 Expected)

Indian Institute of Science, Bangalore

Advisor: Prof. Venkatesh Babu, Video Analytics Lab

CGPA: 9.3/10

B.E. in Information Technology (2015 - 2019)

Vivekanand Education Society's Institute of  
Technology, University of Mumbai

CGPA: 9.54/10

## COURSES AND SKILLS

Courses at IISc	Grade
Deep Learning for Computer Vision	A+
Data Analysis and Visualization	A+
Machine Learning for Signal Processing	A
Numerical Linear Algebra	A

- ❖ Python, Pytorch, Pytorch Lightning, Numpy
- ❖ Version control (Git/Github), Design Patterns
- ❖ C/C++, Shell scripting, Docker, Vim
- ❖ OpenMPI, CUDA Programming, PySpark

## RESEARCH EXPERIENCE

Improving Contrastive Learning using Knowledge Distillation (Ongoing)

- ❖ Awarded [Student Research Grant](#) from Robert Bosch Centre for Cyber-Physical Systems @ IISc Bangalore
- ❖ Use pseudo-labels obtained from self-supervised networks to eliminate false negatives in contrastive learning.

Data-free Knowledge Distillation for Segmentation using Data-Enriching GAN

Preprint: <https://arxiv.org/pdf/2011.00809.pdf> Code: [Seg-DeGAN](#)

- ❖ Extended the Data-enriching GAN framework to perform data-free Knowledge Distillation for Segmentation.
- ❖ Proposed a novel weighted diversity loss and mixed data knowledge distillation to improve performance.

Interpretability of Segmentation Networks

- ❖ Introduced Pix-CAM, an approach to create visualizations for a specific pixel of an image.
- ❖ Showed the effectiveness of the technique to detect failure modes in segmentation networks
- ❖ Used the technique to understand the effect of adversarial attacks

Neural Style Transfer to improve robustness of CNNs

- ❖ Used Neural Style Transfer as a data augmentation technique to improve the generalization of CNNs.
- ❖ Sampled random styles from an embedding space that can be used to augment images.

Face Verification and Forgery Detection for Ophthalmic Surgery Images

Preprint: <https://arxiv.org/pdf/1811.06194.pdf> Code: [Face-verification-siamese-network](#)

- ❖ Solved the task face verification using one-shot learning for a dataset provided by an NGO
- ❖ Used a Siamese Neural network that directly learns a mapping from face images to a compact Euclidean space where distances directly correspond to a measure of face similarity.
- ❖ Deployed the face recognition system for the NGO in collaboration with Mastek

Conferences: Attended and volunteered at ICML'20, Selected as a volunteer at Neurips'20

## PROGRAMMING EXPERIENCE

Parallel Online K Nearest Neighbours ([Code](#)) ( MAY 2020 - JUN 2020 )

- ❖ Developed a parallel algorithm to perform K nearest neighbour search in an online setting.
- ❖ Proposed a balancing algorithm for a parallel KD Tree to ensure minimum communication overhead and fast search. Experiments were performed on a 12 node cluster.

Kharagpur Winter of Code (IIT KGP) ([Open source](#)) ( DEC 2017 - JAN 2018 )

- ❖ Developed a digital assistant for desktop that uses speech-recognition to automate everyday tasks.