+41 78 926 08 69
dhruti96shah@gmail.com
dhruti96shah.github.io
dhruti96shah

Dhruti Shah

Education

2019–Present **Masters in Data Science**, *EPFL*, *5.34/6.0*.
Expected graduation : February 2022
Master Thesis (ongoing) at **IBM Research**
Advised by Prof. Rudiger Urbanke (EPFL) and Cristiano Malossi (IBM Research)
Conducting research in areas of Computer Vision and Signal Processing.

2014–2019 **Bachelors + Masters in Electrical Engineering**, *IIT Bombay*, *9.30/10*.
Shankar Dayal Sharma **Institute Gold Medalist** – awarded for general proficiency
Master Thesis in '*Top-m entity resolution*' advised by Prof. Nikhil Karamchandani
Completed with Minor in Computer Science

Key Projects and Internships

Title **Interactive Fast Annotation Method for Machine Learning pipelines** [2021-22]
Master Thesis (Ongoing), AI Automation Team, IBM Research

Description There still exist several application scenarios in Computer Vision where either the amount or quality of annotations is limited. Further, existing annotation tools present several limitations like operating with application-specific labels like cracks. To address these issues, we are working towards developing a method for auto-annotation.

Title **Improved Image Stitching for Defect and Anomaly Detection** [2020-21]
Research Internship, AI Automation Team, IBM Research
Patent Pending

Description Current image stitching algorithms suffer from scalability, low speed and distort component images for a smooth output. We develop a fast image stitching method that works for a large number of planar images. Our algorithm runs on the GPU providing a speed-up of 30x, and stitches more than 100 images in under 5 min.

Title **Long-term motion prediction using keyposes** [2021]
Semester Project, Computer Vision (CV) Lab, EPFL
Publication in progress

Description We recast human motion forecasting into performing prediction over few essential 'keyposes'. Current works determine the key poses using k-Means clustering and perform sequence prediction using RNN-based architectures. We replace the RNNs with the transformer architecture and explore the use of VQ-VAE models to obtain keyposes.

Title **Top-m entity resolution** [2018-19]
Master Thesis, Signal Processing Lab, IIT bombay
Published in **AAAI 2020** (20.6% acceptance rate)

Description Information theoretic bounds and algorithms to identify the top clusters for entity resolution in presence of an oracle. We provide theoretical proof and empirical study (on Amazon Purchase Dataset) that our algorithm reduces the query complexity from $O(n^2)$ to $O(n \log n)$.

Title **Feature enhancement for flash memory communication** [2017]
Summer Internship, Qualcomm

Description Feature enhancement for flash memory communication between PC and target, now deployed on Qualcomm server. Optimized time requirements by 50% through compression of sparse files & sending smaller data chunks. Innovated the handling of partitions for NAND targets through integration with existing GPT partition tables.

Technical Strengths

Languages Python, C++, C, MATLAB, Spark, SQL, HTML

Softwares Pytorch, OpenCV, Raspberry Pi, OpenGL

Relevant Courses

CS Courses Machine Learning, Computer Vision, Digital Image Processing, Applied Data Analysis, Image Analysis and Patter Recognition, Data Structures and Algorithms

EE Courses Signals and Systems, Digital Signal Processing, Advanced Topics in Signal Processing, Markov Chains, Probability and Random Processes, Information theory and Coding

Math Courses Linear Algebra, Applied Mathematical Analysis, Complex Analysis, Calculus

Leadership and Volunteering

Fall 2017 **Contingent Leader, Inter IIT sports meet**, *IIT Bombay*.
First ever female contingent leader to lead the IIT Bombay contingent at Inter IIT sports meet

2017-19 **Institute Student Mentor**, *IIT Bombay*.
Part of 80 member team to help freshmen students; ensure their smooth transition to college life

2016-19 **Volunteer, Abhiyasika Social Services**, *IIT Bombay*.
Abhiyasika – Student initiative of IIT Bombay to tutor underprivileged students in a slum

Extra-curricular Activites

- **Google Get Ahead Program:** Participated in 6-week virtual program for selected CS students across EMEA; involving technical challenges, YouTube live trainings and interview workshops
- Volunteer at Empowerment Lab, Geneva: taught Data Analytics to 12-16 year olds
- Recipient of **"Institute Sports Roll of Honor"**, the highest sporting honor at IITB
- Awarded **"Person of the Year"** for contribution to sports in the Institute.
- Awarded **"Sports Freshman of the Year"** for outstanding performance, **2** of **880**
- Successfully completed IITB Run & Powai Hiranandani **Half Marathon – 21 km**
- Completed the Runathon, endurance running - **4 hours, 32.8 km** at IIT Bombay