

POORVI HEBBAR

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EDUCATION

Carnegie Mellon University

Master of Science in Computer Vision | GPA: 4.22/4

Key courses: Mathematical Fundamentals of Robotics, Visual Learning and Recognition, Learning from 3D

Pittsburgh, PA

Dec 2023

Indian Institute of Technology, Bombay

Bachelor of Technology with Honors in Computer Science and Minors in Physics

Mumbai, India

May 2021

- Bagged **All India Rank 36** in IIT JEE Advanced among 1.4 million candidates (Top Female Ranker)
- Received the **Undergraduate Research Award** for Bachelor's Thesis

SKILLS

Programming

Python, C/C++, MATLAB, CUDA, JAVA, HTML/CSS, Javascript, Prolog, SQL, Scala, Spark

Frameworks and Softwares

PyTorch, Tensorflow, AWS, Vertex AI, Solidworks, Ansys, Gnuplot

RESEARCH PROJECTS

Diffusion-guided Reconstruction of Everyday Hand-Object Interaction Clips

Dec 2022 - Present

Advisor: [Prof. Shubham Tulsiani](#), Physical Perception Lab | Manuscript accepted at ICCV 2023

- Aim to infer shapes of unknown hand-held objects based on visual features and estimated articulations of the hand
- Hallucinating unobserved areas using novel views rendered by a pre-trained diffusion model (based on geometric cues)
- Optimizing the object's neural field so that the renderings match observations and take physical constraints into account

Robust Classification of Histology Images Exploiting Adversarial Autoencoders [\[blog\]](#)[\[paper\]](#)

Jul 2020 - Jun 2021

Manuscript accepted at IEEE EMBC 2021

- Proposed a novel weighing scheme of training instances based on likelihood of the encoded features in latent space
- Generated robust features with optimized priors, achieved 80.9% classification accuracy on noisy histology datasets

Detection of Brittle Shear Zones in Mesoscale Photographs [\[blog\]](#)[\[paper\]](#)

Jul 2020 - Jun 2021

Manuscript accepted at the Journal of Indian Geophysical Union (JIGU) 2022

- Innovated unsupervised edge-detection and quantization methods to discern and label fracture planes with 92% accuracy

3D Human Pose Estimation and Future Pose Prediction [\[blog\]](#)

Jan 2021 - Jun 2021

- Implemented PoseBERT with relative positional embedding to learn pose-representations from monocular videos
- Investigated an auto-regressive OpenAI GPT2 model to predict human motion; optimized the rate at which output is fed
- Obtained ~4% improvement in pose retrieval scores and ~11% reduction in absolute pose errors on Human3.6M dataset

Anomaly Detection in Proctoring Videos (collaboration with CodeTantra) [\[blog\]](#)

Jul 2020 - Dec 2020

- Integrated an LSTM autoencoder model with human pose features to estimate reconstruction errors in proctoring videos
- Successfully employed online sub-modular maximization to detect top 10% aberrant segments in synchronous settings

WORK EXPERIENCE

Qualcomm AI Research | Autonomous Driving Intern | San Diego, CA

May 2023 - Aug 2023

- Optimized the attention mechanism in Cross View Transformers to improve latency from 3.3 to 113 fps for BEV Perception
- Conducted Neural Architectural Search (NAS) to find backbones that are ~32% faster, while sustaining baseline accuracy
- Surveyed state-of-the-art research in efficient networks and designed a novel search space with proper efficacy analysis
- Accelerated data loading by 4x for cloud based distributed training and integrated with Hardware-In-Loop on Vertex AI

Goldman Sachs | Quantitative Risk Analyst | Bangalore, India

Jun 2021 - Jul 2022

- Backfilled reliable time series for swap rates and Euro future prices of various currencies to aid the LIBOR Transition
- Devised automated benchmark, volatility, and data quality tests to validate, reconcile and sign off portfolio-pricing models
- Drafted an unsupervised framework to identify anomalies in risk metrics, reducing mitigation time from 1 day to 2 hours
- Achieved 97.3% validation accuracy and reduced the PnL estimation time by 47% for 5000 pandemic market-scenarios

Google Research | Software Engineering Intern | Bangalore, India

Jul 2020 - Sep 2020

- Collaborated with a team of 4 to design, develop and launch a digital content recommendation app based on past swaps
- Trained a matrix factorization model with collaborative filtering and embedding of the content vocabulary
- Customized newsfeed based on preferences and general popularity to balance users' taste and awareness of trend

ACHIEVEMENTS AND ACTIVITIES

- One among the 10 Indians to secure the KC Mahindra Scholarship of INR 500 thousand for higher studies 2022
- Awarded the **Sports Roll of Honor** for an exceptional contribution to the Institute Athletics team's success 2021
- Part of the **Institute Student Satellite Team**, modeled the mechanical structure of IITB's second satellite: [Advitiy](#) 2019
- Accorded the **Len Bassar Award** for scientific leadership at the International Science School camp, Sydney 2018
- Honored with the prestigious KVPY Fellowship by the Government of India with an **All India Rank 7** 2017