POORVI HEBBAR

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EDUCATION

Carnegie Mellon University — *Pittsburgh, PA*
Master of Science in Computer Vision | GPA: 4.22/4 — *Dec 2023*
Key courses: Mathematical Fundamentals of Robotics, Visual Learning and Recognition, Learning from 3D

Indian Institute of Technology, Bombay — *Mumbai, India*
Bachelor of Technology with Honors in Computer Science and Minors in Physics — *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 [blog][paper] — *Dec 2022 - Present*
Advisor: Prof. Shubham Tulsiani, Physical Perception Lab | Paper accepted at ICCV 2023 (Oral)

- Inferred the time-persistent implicit field of a rigid hand-held object, the time-varying hand configurations and estimated their relative poses from monocular videos (in-the-wild, 1st and 3rd person); currently extending to articulating objects
- Leveraged the hand configuration and category label as a prior to model the conditional distribution of object renderings
- Guided reconstruction by these augmented data driven priors to address occlusions and limited viewpoint variations

Robust Classification of Histology Images Exploiting Adversarial Autoencoders [blog][paper] — *Jul 2020 - Jun 2021*
Paper 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*
Paper accepted at the Journal of Indian Geophysical Union (JIGU) 2022

- Innovated unsupervised edge-detection and quantization methods to discern, 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 autoregressive 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 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 2x 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
- 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 | Machine Learning 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 Basser 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*