POORVI HEBBAR

phebbar@cs.cmu.edu | (+1) 412-979-8690 | poorvirhebbar.github.io | linkedin.com/in/poorvi-hebbar/

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 | Manuscript accepted at ICCV 2023 (Oral)
- Aim to infer shapes of unknown hand-held objects based on visual features and estimated articulations of the hand
- Hallucinated unobserved areas using novel views rendered by a pre-trained diffusion model (based on geometric cues)
- Optimized 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 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*