Ajay Narasimha Mopidevi

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Education

University of Colorado Boulder — Boulder, CO
Masters of Science in Computer Science — GPA: 4.0/4.0 — *Aug. 2022 – Dec 2023*

Indian Institute of Technology, Guwahati (IITG) — Guwahati, India
Bachelors of Technology in Electronics and Communication Engineering — *Aug. 2013 – May 2017*

Courses: Computer Vision, Computational Photography, Deep Reinforcement Learning, Natural Language Processing

Technical Skills

Languages: Python, C/C++, Matlab
Machine Learning Frameworks: Keras, Pytorch, Tensorflow
Tools: Git, Open3D, Meshlab, CloudCompare, Visual Studio, PyCharm, Eclipse
Libraries: OpenCV, ROS, OpenCL, OpenGL, OpenMP, scikit-learn, pandas, NumPy, Matplotlib

Experience

Samsung Semiconductors India R&D — Bangalore, India
Computer Vision Research Engineer, Advanced Multimedia Solutions Team — *July 2020 – July 2022*

- Developed **3D scene reconstruction** algorithm with only the depth-data from ToF sensors, achieving a real-time processing speed of **20fps**
- Automated the alignment of output 3D scene with groundtruth and improved the **accuracy by 5%** by detecting and removing outliers
- Optimized Samsung's CMOS camera sensor noise reduction algorithm with OpenMP parallel programming, thereby reducing the algorithm runtime by **33%**
- Reduced the latency of Remosaic deep learning models for 200M pixel camera sensor using **quantization** and **pruning** techniques by 10 % with an unnoticeable degradation of 0.1% in perceptual quality

Qualcomm — Bangalore, India
Software Engineer, Audio Quality Validation Team — *Aug. 2017 – June 2020*

- Spearheaded the development and maintenance of python audio library to evaluate both the objective and perceptual audio quality of the Bluetooth headsets
- Enhanced python automated test framework with new features that populate test vectors and visualize audio output signals, leading to a 10%-15% reduction in both the validation and development teams' efforts

Projects

Radar based Navigation
Autonomous Robotics and Perception Group(ARPG) — *Sep 2022 – Present*

- Utilized only the radar data, sparse pointclouds compared to Lidar data, to overcome the challenges in visually degraded scenarios and improved the odometry estimation by **8%** , using **transformer** and DeepVO architecture
- Developed generative transformer architecture for denoising radar pointclouds and generating the incomplete sections in them. Used transformed pointclouds to provide more spatial information in localization and mapping.

Electron Tomography Segmentation
Kasinath Aydin Lab — *May 2023 – Present*

- Achieved 92% accuracy in segmenting electron structures like ribosomes, membrane using $< 1\%$ of the entire tomogram for training
- Designed U-NeXt architectures, combining the ConvNeXt and U-Net, specifically tailored for tomograms captured at different scales, resulting in a f1 score of 85% for segmentation

Publications

- "Tell Me Where to Go: A Composable Framework for Context-Aware Embodied Robot Navigation", Conference on Robot Learning, 2023 *(under review)*
- "MultiNavCon: A Multi-Agent Framework for Landmark-Guided, Language-Based Navigation", International Symposium on Experimental Robotics, 2023 *(under review)*
- "Grouped BERT for Multi-Label classification to reason the human values behind the arguments", Proceedings of the The 17th International Workshop on Semantic Evaluation (SemEval-2023)