Amirtha Varshini A S

+1 (470) 812-5349 | amirtha255@gmail.com | linkedin.com/in/amirtha-varshini-as | amirtha255.github.io

Education

- **Georgia Institute of Technology**, Atlanta, GA — Aug. 2021 - May 2023
  Master of Science in Computer Science (ML Concentration) — ***GPA: 4.0/4.0***
  Graduate Teaching Assistant - AI, Ethics and Society, Mobile & Ubiquitous Computing
- **National Institute of Technology Tiruchirappalli**, India — Jul. 2014 - May 2018
  Bachelor of Technology in Electronics and Communication Engineering — ***GPA: 8.90/10***

Experience

- **Amazon Robotics**, Westborough - *Software Engineer Intern* — May 2022 - Aug. 2022
  - Performed object tracking on segmented shipping labels of the packages handled by Amazon warehouse associates.
  - Developed a novel method using Augmented Reality(AR) in Microsoft Hololens 2 to identify the current package picked or stowed, based on the collision of the tracked package's hologram with a spatially anchored hologram mesh.
  - Successfully enhanced AR-ID, an AI and computer vision-based barcode scanner, from single to multiple active packages
- **Qualcomm**, Bengaluru - *Software Engineer* — Jul. 2018 - Aug. 2021
  - *ADAS platform team* - Designed Minidump feature on QNX Real-time operating system to capture a snapshot of system post-crash. Also built a GDB-based Python and C parser to extract debug information from the RAM dump.
  - Brought down the dump download time by **70%** and the size from **12GB to 300 MB**, enabling faster analysis.
  - Developed FastRPC to offload high-compute tasks from CPU to Digital Signal Processors, improving performance.

Academic Projects

- **Leveraging Object movement predictions for Interactive Robot Assistance** — Aug. 2022 - current
  - *Research Advised by Prof. Sonia Chernova* - Developing an explainable deep generative graph neural network model (GNN) that performs spatio-temporal object tracking and models the future movement of objects in an environment.
- **Deep Reinforcement Learning (RL) based autonomous driving** — Jan. 2022 - May 2022
  - Trained a model-free RL algorithm TQC (Truncated Quantile Critics) and increased rewards by **17%** with experience replay for navigation in self-driving simulator Donkeycar, outperforming benchmark algorithms DDPG, SAC, and PPO.
  - Trained a Variational Autoencoder to compress input into a latent space representation and improved rewards by **42%.**
  - Generated a semantic segmentation mask using a pretrained autoencoder to visualize the model for interpretability.
- **Semantic Similarity and Toxicity Detection of Questions in Quora** — Sep. 2021 - Dec. 2021
  - Performed comparative study on results of BERT, LSTM, RNN, GRU models with NLP word-embedding techniques Tf-Idf Vectorization and Word2Vec to predict intent similarity and toxicity of questions on Quora. **Link**
- **Computer Vision Tools for Non-verbal Communication in Interviews** — Aug. 2021 - Dec. 2021
  - *Research Advised by Prof. James Rehg* Trained Hidden Markov Models (HMM) and K Nearest Neighbours (KNN) models for head gesture detection in interviews using OpenFace keypoints generated on the MIT Interview dataset.
  - Experimented with Multi CONV-LSTM models for head gesture detection using AMI Meeting corpus.
  - **Runner-up at Innovation Competition** 2022, an Entrepreneurial challenge of VentureLabs, Georgia Tech.
- **Low-cost intelligent vision in automotive (LIVA)** — Jun. 2019 - Oct. 2019
  - Collected dataset of depth images using Kinect V2 mounted on a moving car. Achieved object detection in real-time to recognize pedestrians and vehicles by fine-tuning the YOLO V3 model with depth images and COCO dataset.
  - Top 6 finalists out of the 230+ applicants in Maker's Challenge of QBuzz 2019, Qualcomm's annual tech conference.
- **Real-Time Hand Gesture Recognition system** — Jan. 2018 - May 2018
  - Fine-tuned Inception V3 Architecture on ASL dataset to detect hand gestures and controlled a custom-built robotic arm
  - First Place in Final Year Project Competition and **First author of a paper** presented published in ACM ICPS - **Link**

Technical Skills

- **Languages**: Python, C, C++, C#, SQL, HTML, CSS, JS, PHP, Bash, TCL
- **Libraries, Platforms**: PyTorch, TensorFlow, Scikit-Learn, Pandas, Numpy, OpenCV, Linux, QNX, ARM V8, CUDA, Unity
- **Coursework**: Machine Learning with Limited Supervision, Computer Vision, Deep Reinforcement Learning for Intelligent Control, Graduate Algorithms, Machine Learning, Deep Learning Specialization, Operating Systems, Computer Networks

Awards & Achievements

- Recipient of **K. C. Mahindra Scholarship** for Post Graduate Studies Abroad, 2021
- Recipient of **AIEEE Merit Scholarship for Rank 1448 (Top 0.1% amongst 1,350,000 candidates)** in JEE mains'14