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 - CS 6603: AI, Ethics and Society
- **National Institute of Technology Tiruchirappalli**, India — Jul. 2014 - May 2018
  Bachelor of Technology in Electronics and Communication Engineering — ***GPA: 8.90/10***

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
- **Graduate Coursework**: Machine Learning with Limited Supervision, Computer Vision (CV), Deep Reinforcement Learning for Intelligent Control, Graduate Algorithms, ML, Qualitative HCI methods, Deep Learning Specialization (Coursera)

Experience

- **Amazon Robotics**, Westborough - *Software Engineer Intern* — May 2022 - Aug. 2022
  - Performed object tracking on the packages in a warehouse by integrating with the segmented shipping labels returned by AR-ID, an ML, and CV-based solution. Successfully enabled AR-ID to process multiple packages using this tracking.
  - Developed an app 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.
- **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
  - *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 daily-use objects in a home 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
  - Achieved F1-score of 0.7 by fine-tuning BERT to predict question sincerity and accuracy 0.89 for questions' similarities.
  - Using PyTorch, compared the results of BERT, Bi-LSTM, Bi-RNN, and Bi-GRU models with NLP word-embedding techniques Tf-Idf Vectorization and Word2Vec to predict intent similarity and toxicity of questions on Quora.
- **Computer Vision Tools for Non-verbal Communication in Interviews** — Aug. 2021 - Dec. 2021
  - Trained K Nearest Neighbours(KNN) model to estimate head pose in videos with accuracy **83%**. Obtained features as the difference in minima and maxima of first-order pitch differences, from OpenFace Keypoints output on AMI 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 accuracy **85%** in real-time to recognize pedestrians and vehicles by fine-tuning 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 gestures with 98% accuracy and controlled a robotic arm
  - A.S.Amirtha Varshini, "Real-time Hand Gesture Recognition for Robotic Arm and Home Automation", (ISEEIE 2021)

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