NARAYANAN ELAVATHUR RANGANATHA

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CAREER OBJECTIVE

To be part of a team engaged in designing and deploying AI methodologies using deep learning frameworks on intelligent physical systems and improve my knowledge and assimilation of new technology in the field.

EDUCATION

- **University of California San Diego** *September 2022 - June 2024*
  Master of Science in Computer Science.
- **Manipal Institute of Technology, Manipal** *August 2016 - July 2020*
  Bachelor in Technology in Computer Science, Minor in Intelligent Systems. CGPA: 9.11/10

PUBLICATIONS

- **SpeechMix - Augmenting Deep Sound Recognition using Hidden Space Interpolations**
  - Proceedings of the 21st INTERSPEECH Conference 2020.
  - Authors - Amit Jindal, **Narayanan Elavathur Ranganatha**, Aniket Didolkar, Arijit Ghosh Chowdhury, Di Jin, Ramit Sawhney, and Rajiv Ratn Shah

WORK EXPERIENCE

- **Google Summer of Code (GSoC) at Open3D** [code] Jun 2022 - Sep 2022
  Open Source Contributor
  - Implemented the 3D Object detection model - PV-RCNN++ - in PyTorch and TensorFlow and training it on large-scale datasets such as the Waymo Driving Dataset to reproduce the original author's results.
  - The Pull Request is undergoing code-review.
- **IIITD Autonomous Last Mile Vehicle (ALIVE)** Oct 2020 - Aug 2022
  Research Engineer, Vision & Learning
  - Created camera-based object detection and tracking module for deployment.
  - Setup infrastructure for benchmarking several state-of-the-art 2D object detectors on autonomous driving datasets such as BDD100K and Indian Driving Dataset on A100 servers.
  - Created ROS nodes for deploying these detectors on a Jetson AGX Xavier as part of the autonomous stack of the car using Torchscript and OpenCV and achieved a frame rate of 22 FPS.
  - Wrote code to calibrate a single-camera-single-lidar setup. This information was then used to map objects detected in images into the LIDAR coordinate frame to be used by the planning stack.
  - Created a Kalman Filter that fuses Camera detections and LiDAR data using calibration information to track objects across frames and to estimate position and speed of detected objects.
  - Carried out extensive testing of the above stated modules in the CARLA simulator by deploying autonomous agents that use this information and navigate.
  - Supervised a B.Tech. Project (BTP) for a team of two students on building an annotation tool that uses calibration information to facilitate multi-sensor annotation.
  - Implemented a pipeline for cross-modality registration between a LiDAR 3D point-cloud and an RGB-camera image by leveraging the geometric structures like planes and linear edges present in the scene.
- **Samsung R&D Institute India - Bangalore Pvt. Ltd.** Jan 2020 - June 2020
  Student Trainee
  - Brought up the Near Real-Time RAN Intelligence Controller (RIC) Kubernetes cluster.
  - Established connection between Near Real-Time RIC cluster and RIC dashboard to facilitate deployment of xApps and creation of new policies.
  - Wrote xApp components to communicate between xApp and the Near Real-Time RIC A1-Mediator.
  - Used RIC Message Router APIs to facilitate movement of policies across the cluster components.
  - Created Helm charts and Docker images for the xApps.

- **Robotics Research Center, IIIT Hyderabad** May 2019 - July 2019
  Research Intern
  - Created a ROS-aware Gazebo plugin to incorporate path planning for actors in Gazebo.
  - Treated actor as a mobile base in the plugin, and retrieved the costmap via the costmap_2d node.
  - Applied the A-star algorithm on the retrieved costmap for generating paths via the navfn package.
- **Symbl.ai** Dec 2018
  Data Science Intern
  - Extracted 'action items' and filtered out chit-chat from meeting transcripts via a a two-layer GRU model implemented in Keras.
  - Trained Bidirectional GRU with attention mechanism for punctuation restoration model.
  - Augmented training data by analyzing constituency tree and part-of-speech tags and used Google Sentence Encoder to extract sentences with the same semantic meaning by using similarity metrics such as a cosine similarity for targeted training.
- **Project Manas(Robotics team at Manipal University)** Feb 2018 - Feb 2019
  AI Researcher
  - Understood and implemented reinforcement learning algorithms - DQN, policy gradients, and A3C.
  - Solved environments provided by OpenAI gym such as the gym-minigrid, using these algorithms.

PROJECTS

- **CodeFlood - Road Segmentation using satellite images [code]**
  - Trained a Dilated U-net for segmentation of roads in satellite images collected via the MapBox API.
  - Used this output to detect flooded areas.
  - Built a website to speed up relief operations during floods for our submission for Codefundo 2018.
- **PyTorch Implementation of SAdam [code]**
  - Performed a reproducibility study of the paper SAdam: A Variant of Adam for Strongly Convex Functions as part of the *ML Reproducibility Challenge 2020*.
- **PyTorch Implementation of Adversarial Mixup Resynthesis [code]**
  - Implemented the model presented in the paper - On Adversarial Mixup Resynthesis.
  - Reproduced results on MNIST, KMNIST and SVHN datasets.
- **Anime Faces Generative Adversarial Network [code]**
  - Created a GAN that is able to generate faces of Anime Characters.
  - Used a crawler coded in python to collect anime character faces from across the internet.
  - Coded a WGAN in Tensorflow and fit it to the data generated via the crawler.
- **Attitude and heading reference system**
  - Calculated acceleration, angular velocity and height for optimum payload deployment using accelerometer (ADXL345), gyroscope (L3g4200d0) and barometer (BMP085) of a make-shift rocket.
  - Used a compass made with a magnetometer (HMC5883L) to determine the heading.

COURSES

- **Self Driving Car Engineer Nanodegree** - Udacity

TECHNICAL STRENGTHS

Languages	C++, C, Python
Libraries and Frameworks	ROS, PyTorch, Tensorflow, Numpy, OpenCV
Software & Tools	Docker, Kubernetes, SLURM, Latex

EXTRA-CURRICULAR

Swachh Bharat Internship - Worked for 100 hours on cleaning of the village of Chithhara. Provided cleaning equipment, educated the residents on how to use this equipment and held awareness campaigns about good and bad hygiene practices.

Brown Belt Holder - 4th Kyu by Sports Karate-Do Association