

# NARAYANAN ELAVATHUR RANGANATHA

NOIDA, Uttar Pradesh

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## CAREER OBJECTIVE

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To be part of a team engaged in designing and deploying Artificial Intelligence methodologies using deep learning frameworks on intelligent physical systems such that it improves my knowledge and assimilation of new technology in the field.

## EDUCATION

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- **Manipal Institute of Technology, Manipal** *August 2016 - July 2020*  
Bachelor in Technology in Computer Science, Minor in Intelligent Systems. CGPA: 9.11/10
- **Apeejay School, NOIDA** *March 2016*  
High School, All India Senior School Certification Examination Overall Percentage: 92.80

## PUBLICATIONS

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

## WORK EXPERIENCE

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- **IIITD Autonomous Last Mile Vehicle (ALIVE)** *Oct 2020 - Present*  
*Engineer, Vision Learning*
  - Worked on the camera-based object detection, traffic light detection and tracking module.
  - Setup infrastructure for benchmarking several state-of-the-art 2D object detectors on autonomous driving datasets such as BDD100K.
  - 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.
- **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 achieve communication between xApp and the Near Real-Time RIC A1-Mediator via RIC Message Router APIs to facilitate movement of policies across the cluster components. This involved creating Helm charts for the xApp and creating the Docker image for the xApp with the required functionality coded in C++.
- **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. The actor is treated as a mobile base by the plugin. The costmap is retrieved via the costmap\_2d node. The A-star algorithm is then applied 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 speech to text data from meetings.
  - Trained Bidirectional GRU with attention mechanism for punctuation restoration model.

- Designed and trained a 2 layers GRU model in Keras to classify an input sentence as relevant after the meeting or not.
- Augmented the training data by analyzing constituency tree and part-of-speech tags, synonym insertion, and using Google Sentence Encoder to extract sentences with the same semantic meaning by using similarity metrics such as cosine similarity.
- **Project Manas(Robotics team at Manipal University)** Feb 2018 - Feb 2019  
*AI Researcher*
  - Understood and implemented reinforcement learning algorithms - DQN, policy gradients, and A3C on the environments provided by OpenAI gym such as the [gym-minigrid](#) environment.

## PROJECTS

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- **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 as part of our submission for Codefundo 2018.
- **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 that collects anime character faces from various sources across the internet. Coded a WGAN coded in tensorflow and fit it to the data generated via the crawler.
- **Behaviour Cloning**  
 Trained a convolution neural network based on a variant of the LeNet architecture. Collected driving data for regular driving as well as recovery data on a simulator to teach the car to track lane centers.
- **Vehicle Tracking and Detection**  
 Trained a support vector machine (SVM) classifier using Histogram of Oriented Gradients (HOG) to identify car and non-car images. Used windows of different sizes across frames of video (smaller windows to detect cars far away and larger windows to detect closer ones) as input to classifier to detect the cars in the video. Used thresholds based on confidence of classification of the SVM to remove false positives.
- **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

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- Deep Learning Specialization - deeplearning.ai - Coursera
- Term-1 Self Driving Car Engineer Nanodegree Program - Udacity
- Reinforcement Learning - University College London
- CS231n - Convolutional Neural Networks for Visual Recognition - Stanford University

## TECHNICAL STRENGTHS

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<b>Languages</b>	C++, C, Python
<b>Libraries and Frameworks</b>	ROS, PyTorch, Tensorflow, Numpy
<b>Software &amp; Tools</b>	Docker, Kubernetes, Linux, Windows, Latex

## EXTRA-CURRICULAR

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Swachh Bharat Internship - Worked for 100 hours in Chithhara village & conducted awareness campaigns.  
 Brown Belt Holder - 4th Kyu by Sports Karate-Do Association