Bharath Raj Nagoor Kani

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medium.com/@thatbrguy | thatbrguy.github.io

Education

Sri Sivasubramaniya Nadar College of Engineering — Affiliated to Anna University
B.E. in Electronics and Communication Engineering (ECE) — *June 2015 – Apr 2019*

Experience

Siemens Digital Industries Software
Associate ES Engineer — *May 2019 – Present*

- Lead the design and development of a fast and robust lane estimation system that can detect and track ego lane lines. Optimized it to handle several non-ideal scenarios.
- Currently in the process of integrating the above system with a larger ROS based perception tool chain.
- Created a data pipeline to generate a mid-level representation of the top-view of the scene around an ego-vehicle which was used for training imitation learning algorithms.
- Developed tools for visualizing and interpreting features learnt by the imitation learning algorithms. Helped with experimentation to improve the performance of some of the above algorithms.
- Currently working on an internal project to analyze the impact of using Pseudo LIDAR created using RGB images and depth maps for 3D object detection.

Orbuculum
Data Science R&D — *Aug 2018 - Apr 2019*
Data Science Intern — *Jan 2018 - Apr 2018*

- Explored the usage of several machine learning techniques to classify and identify salient parts of genomic data.

CloudCV
Google Code-In Mentor — *Oct 2018 - Dec 2018*

- Google Code-In is an event where students of the age group 13-17 contribute to open source organizations.
- As a mentor for the project Fabrik, I helped students complete their tasks and provided extensive code reviews and feedback.

Publications

Exploring Techniques to Improve Activity Recognition using Human Pose Skeletons
Bharath Raj N., Anand Subramanian, Kashyap Ravichandran, Venkateswaran N.

- Explored the efficacy of using hand crafted feature extraction techniques and some train-time techniques such as keypoint dropout on improving human pose skeleton based activity recognition performance.
- Published at the HADCV workshop at WACV 2020.

Single Image Haze Removal Using a Generative Adversarial Network
Bharath Raj N., Venkateswaran N.

- Created a conditional GAN based architecture to dehaze images.
- The model uses the 56 Layer Tiramisu as the generator and has a weighted loss function.
- Code and first version of the preprint were launched in 2018. Project currently has 60 stars on GitHub.
- Paper published at WiSPNET 2020

Selected Projects

Deploying Tiny YOLOv2 on Jetson Nano using DeepStream

- Deployed an ONNX model on NVIDIA Jetson Nano using the DeepStream SDK which is built on top of the GStreamer framework.
- Repurposed C++ code to parse the outputs of the TinyYOLOv2 model and to integrate it with DeepStream.

Activity Recognition System based on Human Pose Estimation

- Used OpenPose to extract poses and implemented a custom BRIEF based multi object tracker.
- Enabled the use of multiple LSTMs in different CPU processes to enhance speed of the overall system.

- Created a pipelined system with functionality for stitching output from processed frames in order.
- Overall system obtained around 7FPS.

Fill Bot

- Created a python program that can solve puzzles from the android game Fill.
- The puzzle involves finding a Hamiltonian path in the given grid given a starting node. Destination node is not given by the puzzle.
- Used image processing techniques to parse the game map into a graph. Then, used rules and multiple DFS searches to solve the problem.

Technical Skills

Languages: Python, C++, C, JavaScript, MATLAB
Frameworks: ROS, TensorFlow, PyTorch, React, Flask
Libraries: PCL, OpenCV, Numba
Developer Tools: GCP, AWS, GIMP, PostgreSQL

Achievements

Winner | *Motorq Hackathon, MIT (Chennai)* March 2019

- Demonstrated a proof of concept of an Android app that could be potentially used to non-intrusively detect potholes using an LSTM that analyzes sensor readings from the mobile phone.

People's Choice Award | *Yet Another Hackathon, SVCE* August 2018

- Presented a wearable device created using a Raspberry Pi and an accelerometer sensor that can detect if a person has been assualted and if so send SMS alerts.

Runner Up | *Data Science Challenge, IIT Madras* April 2018

- A 10 day contest hosted on kaggle involving a highly skewed dataset to detect debit card fraud.

Runner Up | *AWS Deep Learning Hackathon, IIT Madras* Jan 2018

- Trained an object detection algorithm that could detect a few hand signs.

First Place | *Project Presentation, SSNCE* August 2017

- Presented a live demonstration of a CNN that could break some simple captcha.

Best Outgoing Boy | *Higher Secondary School, SJBN* 2015

State 2nd, International 18th | *National Cyber Olympiad, SOF* 2014

Miscellaneous

Author of Technical Blogs | *Medium*

- Created several technical blogs mostly revolving around machine learning and computer vision concepts.
- Total view count across all articles combined is more than 500k. Medium profile has about 2.6k followers.

Under Seceretary General, Logistics | *SSN Model United Nations*

- Head of Logistics for SSN MUN 2018

Event Head | *SSN Invente*

- Organized IBM OpenPOWER AI4Good Hackathon at SSN Invente 2018

Machine Learning Domain Head | *Tech Club SSN*

- Conducted technical classes and events for juniors as the machine learning domain head of Tech Club SSN during my final year of study.
- Created a website for Tech Club SSN.

School Pupil Leader | *Higher Secondary School, SJBN*