Aaron Jacob Varghese

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EDUCATION

Boston University Boston, MA
Master of Science in Computer Science *Expected December 2020*

International Institute of Information Technology (IIIT-H) Hyderabad, India
Bachelor of Technology in Computer Science and Engineering (Honors in Computer Vision) *April 2019*

EXPERIENCE

Intel Corporation Bangalore, India
Machine Learning Intern *June 2018 - July 2018*
- Performed an extensive research study on efficient semantic segmentation methods with a goal to devise a method for real-time segmentation for autonomous driving applications (Variable Quantized Ensemble Networks)
- Implemented and trained newly released segmentation models for comparison with existing state-of-the-art models using PyTorch and Tensorflow on Berkeley Deep Drive Dataset and Indian Driving Dataset

Center for Visual Information Technology, IIIT-H Hyderabad, India
Undergraduate Researcher *May 2017 - May 2019*
- Developed a portal with React and Express.js allowing multiple annotators to simultaneously annotate video datasets
- Built an Android app using Tensorflow Lite to process and analyze facial expressions and actions of drivers
- Developed a system using quantization and ensemble learning to improve the efficiency of semantic segmentation

Froogal - A digital loyalty startup Hyderabad, India
Software Development Intern *May 2017 - August 2017*
- Built a mobile app for Froogal's web-based services using React Native, Android Studio and Xcode
- Released on Google's Play Store and Apple's App Store with more than 10,000 downloads

International Institute of Information Technology Hyderabad, India
Teaching Assistant *August 2017 - April 2019*
- Teaching Assistant for Computer Vision (Spring '19, 120 students) and IT Workshop (Fall '17, 200+ students).

PROJECTS

Distributed TicTacToe and chat room
- Developed a distributed TicTacToe game, in a client-server setup using the Java RMI protocol
- Parallelized the game server to handle multiple games, along with a chat server for multiple clients/client groups

Variable Quantized Ensemble Networks
- Developed a system geared towards real-time semantic segmentation through variable quantization of ensembles of neural networks, trained on pre-determined groups of classes of Cityscapes Dataset and Indian Driving Dataset
- Applied proposed method to state-of-the-art semantic segmentation models PSPNet and Deeplab-v3+, showing a 10% accuracy trade-off for large improvements in inference time and almost 20% reduction in memory usage

Mini SQL Engine
- Built an SQL engine in Python to parse and execute SQL commands, with relevant error handling

AngelSafe
- Designed and implemented a website focused on promoting safety of women during travel by making use of crowdsourced data to generate heat maps representing threat levels in a particular area
- Secured first place in the Code.Fun.Do hackathon online round organized by Microsoft India in Hyderabad

Game development projects
- Developed variations of the popular games BrickBreaker and Bloxorz in 2D and 3D respectively using OpenGL
- Designed and developed a game in Unity3D, incorporating particle effects, projectile physics and collider mechanics

Computer Vision and ML projects
- Implemented a music genre classification system using Mel Frequency Cepstral Coefficients (MFCC)
- Developed an application for automated cartoon coloring using level-set and continuity of patterns and intensity

TECHNICAL SKILLS AND RELEVANT COURSES

Programming Languages: C++, Python, Javascript, SQL, Java, Bash, C#

Libraries and Tools: React, Android Studio, PyTorch, scikit-learn, OpenCV, Keras, OpenGL, Unity, Selenium

Relevant Courses: Software Engineering, Database Systems, Computer Vision, Principles of Programming Languages, Distributed Systems, Algorithms, Data Structures, Digital Image Processing, Artificial Intelligence, Game Design