

Aaron Jacob Varghese

<https://arn197.github.io>

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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) *August 2015 - 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 several 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 web-based portal with React to allow multiple annotators to simultaneously annotate video datasets
 - Built an Android app using Tensorflow Lite to process and analyze facial expressions and actions of drivers
 - Devised a method based on quantization and ensemble learning to improve 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*
 - **Courses :** Computer Vision (Spring '19) and IT Workshop (Fall '17).

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
- **Mini SQL Engine** Built an SQL engine in Python to parse and execute SQL commands, with relevant error handling
- **Variable Quantized Ensemble Networks (under review at WACV'20)**
 - Research project to achieve 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 an acceptable reduction in accuracy for large improvements in inference time and memory usage
- **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 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
- **Relevant Courses:** Software Engineering, Database Systems, Computer Vision, Principles of Programming Languages, Distributed Systems, Algorithms, Data Structures, Digital Image Processing, Statistical Methods in AI, Game Design