

EE243 Project abstract

Traffic sign recognition by computer vision played one of the key roles in the development of autonomous vehicle. Based on the research by Shustanov, A. et al. [1] regarding real-time traffic sign recognition with Convolutional Neural Network, I am going to implement the idea in the smartphone (iPhone with GPU). The training set would be “German Traffic sign benchmark”, and the test set would be the real-world image taken behind the front windscreen. The app would automatically analyze the image and recognize different traffic signs on the road. I will utilize the common tools for implementing computer vision and machine learning like TensorFlow, and AWS to build the proposed system. Instead of using the CUDA code from the paper, I would use Metal and CoreML for utilizing iPhone GPU. Ultimately, I would optimize the speed of CNN working locally with GPU on the phone, and compare the efficiency between uploading to the cloud via LTE and let the AWS server finish the computation.

Reference:

- [1] Shustanov, A., Yakimov, P., (2017). CNN Design For Real-Time Traffic Sign Recognition Procedia Engineering, Vol.201,pp.718-725.
- [2] Habibi Aghdam,H.,Jahani Heravi,E., Puig,D. (2016)A Practical Approach for Detection and Classification of Traffic signs using Convolutional Neural Networks. Robotics and Autonomous System, Vol.84,pp.97-112.
- [3] Kardkovacs, Z.T., Paroczi, Z.,Siegler,A.,(2011)Real-Time Traffic Sign Recognition System. 2nd International Conference on Cognitive Infocommunications.
- [4] Zhu, Y.Y., Zhang, C.Q., Zhou, D.Y., Wang, X.G., Bai, X., Liu, W.Y.,(2016).Traffic Sign Detection and Recognition Using Fully Convolutional Network Guided Proposals.Neurocomputing,Vol.214,pp.758-766.