EYE FOR THE BLIND WITH GPU &CNN

INTRODUCTION

According to World Health Organization (WHO), 285 million people are visually impaired worldwide; 39 million of them are blind. Thanks to Braille, which helps in visualizing the world. However, there are limitations on the same. How about reading newspaper? What about recognizing numbers that are everywhere?

Can't we design something that can help them to visualize by some other means. This motivated us to design an "EYE FOR THE BLIND".

Deep Learning powered computer vision has the potential to make our vision to reality. Imagine a visual impaired person can read a newspaper by placing it in front of camera. The cameras are executing computer vision algorithms for extraction and recognition powered by trained convolutional neural networks.

We used NVIDIA Jetson TX1 as the hardware accelerator for better performance. Remote access of the system is through socket communication and gives response in an interactive human speech.

Analysis

Performance analysis can be done while training the neural network between the CPU and GPU. The learning rate of the network varies in CPU and GPU.

1) Test Accuracy and Train Loss with Iteration.
2) Time vs Test Accuracy
3) Time vs Train Loss
4) Classification vs time

Goal

To develop a system that detects the numbers present in Sudoku and transfer them over the air using UDP communication, convert the data received into speech signal.

Code Reference

We are novice to the field of machine learning. So, started with basic application of detecting the handwritten digits. The tutorial we followed is
http://caffe.berkeleyvision.org/gathered/examples/mnist.html