

Team 3 Bi-weekly Report : 01

January 12th - January 26th

Summary

- We were able to figure out a way to train our dataset of interest on the tensorflow version of MobileNet SSD. Currently, it takes 3 seconds per epoch on a CPU. We have also talked to our client about acquiring an Amazon EC2 instance so that we can train it on a GPU and get it working faster.
- We have been conducting small tests and reading research papers to figure out the depth measurements.

Pending Issues

- Our client suggested we look into depth measurement using neural networks and suggested looking into [Depthnet](#) and [w-net](#). Hence, we will look into them and compare it with the distance measurement techniques we have researched into.

Plans for the Upcoming Work Period

- Set up MobileNet SSD on the Amazon EC2 instance.
- Train the 500 images of fences on the Amazon EC2 instance.
- Acquire additional images of ditches and terraces and train the neural network on that as well.
- Review papers related to depth-net and w-net and compare it with the triangle similarity and stereo camera methods.
- Implement some of the distance measurement techniques we have discussed as a sub-group

Individual Contributions

John:

- Team Role: Communications Lead
- Contribution:
 - Read academic papers discussing various methods of obtaining depth measurements from data obtained through a single camera.
 - Discussed the feasibility of this with other members of the distance subteam (Fahmida and Ashley).

- Began to implement a basic proof of concept using triangle similarity to see how much of an effect estimating object size has on the accuracy of the distance calculation.
- Hours Worked: 5

Souparni:

- Team Role: Meeting Facilitator
- Contribution
 - Tried to train the MobileNet SSD with the caffe framework but failed due to issues with shell scripts that did not generate the files correctly.
 - Switched to the MobileNet SSD with tensorflow as backend.
 - Followed steps to train our pictures of fences on the mobilenet SSD with tensorflow. Was able to successfully get the training started on a CPU. Further training will be continued on the Amazon EC2 instance.
 - Collaborated on all of the above with Bowen and Eric.
- Hours Worked: 8

Fahmida:

- Team Role: Tester
- Contribution:
 - Read *Measuring Distance with Mobile Phones Using Single-Camera Stereo Vision, Distance Measurement Using a Single Camera with a Rotating Mirror, Distance measuring based on stereoscopic pictures* to compare distance measurement using single camera and stereo camera methods and added notes related to it in the google doc.
- Hours Worked: 6

Ashley:

- Team Role: Document Manager
- Contribution:
 - Read various academic papers for distance detection with one versus two cameras
 - Met as a sub-squad to discuss feasibility of a single camera system
- Hours Worked: 6

Eric:

- Team Role: Webmaster
- Contribution:
 - I've been working through the tutorials on using TensorFlow's core API as well as a few higher level APIs such as tensorflow.estimator
 - I've learned about softmax regressions and used them on the MNIST dataset

- I've helped Souparni and Bowen do some data pruning of our test data, since images and annotation files were mismatched.
- Hours Worked: 8

Bowen:

- Team Role: Hardware Maintainer
- Contribution:
 - Tried to train the Caffe version of MobileNet SSD.
 - Installed Tensorflow's object detection.
 - Processed ImageNet's data, including images and labels.
 - Started to train MobieSSD using tensorflow.
- Hours Worked: 8