

sdmay18-03: Use of imaging devices and machine learning software to assist in autonomous veh

Week 6 Report

October 5 - October 15

Team Members

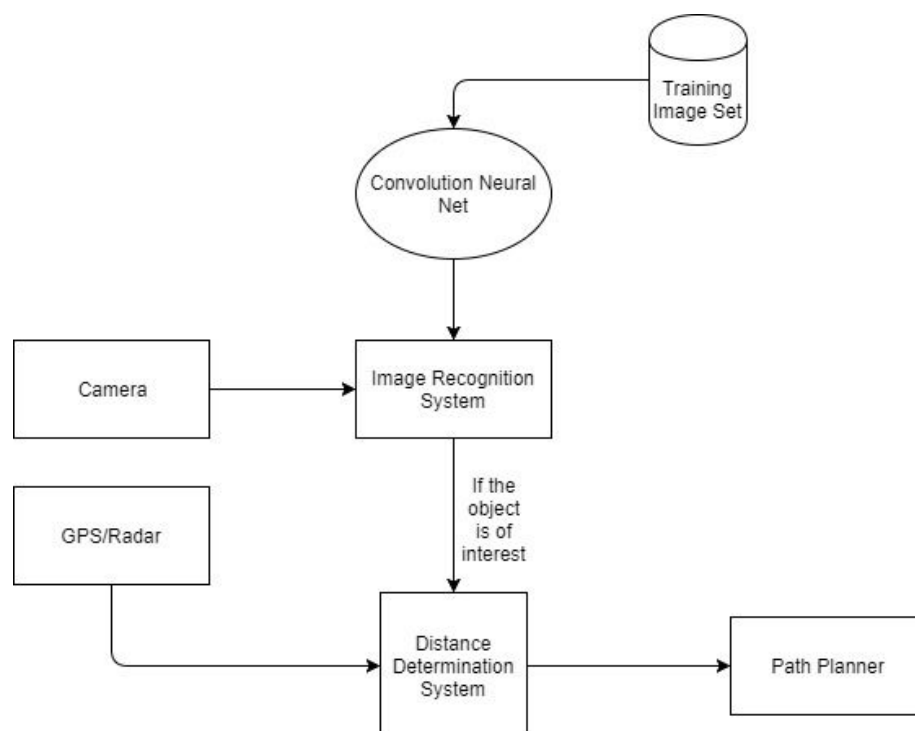
John — *Communication Lead*
Souparni — *Meeting Facilitator*
Fahmida — *Tester*
Ashley — *Document Manager*
Eric — *Webmaster*
Bowen — *Hardware Maintainer*

Summary of Progress this Report

The primary goal for this work period was to compare different options for object detection neural nets. On the production hardware, YOLO was only running at about 3-5 FPS which doesn't provide the real time performance our project requires. With the help of our client, we've found SSD (single shot detection) to be a promising option. We tried to install it on our computers but have been running into lots of issues installing the Caffe framework that is required for the SSD to run. As a result, we have not been able to test it yet.

We have finished acquiring over 600 images of fences, terraces and ditches in total and have saved them for training our SSD in the future. In addition to that, we have finalized our concept sketch that describes the way our object determination system will work alongside our distance determination system.

Concept Sketch:



This is the basic block diagram for our system. The external hardware we are using is a camera and a GPS/Radar which will work hand-in-hand with the Neural network to do classify images and determine distance.

Pending Issues

We are unable to get SSD installed and running on any of our computers so we are not able to test its performance or accuracy.

Plans for Upcoming Reporting Period

We will try to obtain a linux computer to install and test SSD on. After doing so we can compare it to YOLO and come to a conclusion on which we plan to use for the remainder of the project.

Individual Contributions

Team Member	Contribution	Weekly Hours	Total Hours
John	Began reading through paper on SSD and looked into other alternative open source neural nets. Attempted to install SSD/Caffe but ran into problems with Windows. Began looking distance determination in Python Worked with team to finalize concept sketch.	5	35.5
Souparni	Read through SSD paper and tried to install SSD on a Windows computer but ran into problems. Looked up alternatives to allow us to install it.	4	32.5
Fahmida	Read through FieldSAFE research paper and looked into alternative object detection systems, including reading papers on Darkflow and SSD.	4	29.0
Ashley	Began reading SSD paper to better understand neural network options. Attempted to install SSD locally but ran into issues with Caffe on Mac.	7	31
Eric	Began reading Darkflow and SSD papers. Looked into setting up ROS to utilize a training set.	6	30
Bowen	Read through YOLO paper and began reading SSD paper. Looked into other object detection systems as well.	6	30.5

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