

CprE/SE 491 – Dec 1721

AutonomousPrime Senior Design Team

Week 9 Report

March 27 - April 2

Faculty Advisor: Phillip Jones

Team Members:

Daniel Nugent — *Team Leader, Integration*

Jens Petersen — *Key Concept Holder, Integration*

Rockie Brooks — *Team Communications Leader, Neural Network Architecture*

Brian Rye — *Team Webmaster, Embedded*

Zach Bennett — *Team Webmaster, Embedded*

Anne Tesar — *Key Concept Holder, Neural Network Architecture*

Summary for Progress this Week

We completed the second draft of the Project Plan.

Past Week Accomplishments

Zach - Tested PPM capture on Arduino. Got Arduino to capture PPM Signal from RC controller and output 2 PWM Signals to LED's. Attempted to set up Servo controls from PPM but could not get working. Found ServoTimer2 library online and figured out how to implement servos with that. Continued updates to website and wiki.

Brian - Added some documentation about setting up an Odroid to the wiki and helped with Project Plan 2.0. Looked into installing software on the Odroid, found out that Tensorflow requires at least 16 GB of space. Worked on finding the proper installation process for less space consuming programs. Tested the install of Bazel, it works!

Jens - Made some updates to the Project Plan V2.0. read through and made changes based on new information which caused a redirection in our project. Created PowerPoint presentation. Worked on physical car setup to help ensure that the vehicle would be ready for gathering test data. Mounted the camera and found some potential ways to mount a front guard.

Anne - Spent time making revisions to the Project Plan V2.0. More Tensorflow investigations. Played with the Autopilot-Tensorflow project. Tried to substitute our mock dataset directly, the results of which aren't very clear. I was trying to get it to run with the video debugger, but was

having not much success. It may just be too small a dataset. Will continue studying Autopilot as it seems a very comparable project.

Daniel - Messed with the Nvidia Autopilot. Took 9 hours to train on titan x. Ran at 350fps. Achieved 90 fps on my laptop. Achieved 11 fps on raspberry pi 3. Created co processor spec document and help zach with PPM/PWM stuff. Helped with project plan 2.

Rockie - Project Plan 2.0 revisions and submission. Researching datasets for testing. Started work on end of semester presentation.

Pending Issues

- We need more space on the Odroid in order to install Tensorflow. This would allow for us to continue testing on a device other than the Jetson TK-1.
- Need to order parts

Individual Contributions

Team Member	Contribution	Weekly Hours	Total Hours
Daniel Nugent	Project plan. Nvidia autopilot. co processor spec document	16	68
Jens Petersen	Project plan. PowerPoint. Car setup	5	36
Rockie Brooks	Project plan, data set research, end of semester presentation	8	39
Brian Rye	Work on Odroid installation scripts and testing of different OS configurations with necessary software	10	49
Zach Bennett	Arduino controls work. Continued web maintenance	13	51
Anne Tesar	Project Plan work. Tensorflow research/experiments. Work with Autopilot-tensorflow	6	45

Comments and Extended Discussion

Plans for Coming Week

Zach- Continue refining Arduino control Servo. Continue maintenance to website and Wiki

Anne - Start on the framework for our neural network. Establish standards for dataset format, be able to read in images and labels.

Rockie - Finish final presentation slides. Work on testing similar datasets that I can find.

Daniel - Create coprocessor communication protocol. Create basic data recorder.

Jens - Continue PowerPoint once we figure out what slides we originally talked about in class last Tuesday. Continue vehicle setup. Work toward getting parts ordered really soon.

Brian - Continue to work on Odroid installation scripts and work on installing Tensorflow once the 32 GB Micro SD card arrives. Look into Docker installation with different operating systems.

Summary of Weekly Advisor Meeting

Need to send Jones Design Document (done)

Order Proposal is done

CNN Training - do we start from scratch or modify similar model