

CprE/SE 491 Weekly Report #2

Date: 1/31/2017 - 2/6/2017

Dec1709 - ALVINN

Autonomous Vehicle Mission Processor with Machine Learning

Team Leaders:	Bijan Choobineh Darren Davis	Advisors:	Dr. Jones & Dr. Zambreno
Communicator:	Tracy La Van	Client:	Josh Bertram - Rockwell Collins
Key Concept Holders:	Jesse Luedtke David Schott	Email:	dec1709@iastate.edu alvinn@iastate.edu
Webmaster:	Robert Stemig		

Weekly Summary:

On Tuesday evening, we met with our client Josh Bertram for the first time. We met as a large group (Dec1710 was also present). The project still seems very open-ended so we will need to work in the next few weeks to pick a scope and begin to narrow down what we plan to accomplish in Senior Design. We also worked with the client to set up bi-weekly (every other week, not twice weekly) and our advisors to set up weekly meeting times. At our weekly meeting, we discussed the to-dos we received from our advisors and follow ups from our client meeting.

Past Week Accomplishments:

- **As a Group:** Had initial meeting with the client and met with advisors again to start figuring out project details; brainstormed, voted on, and decided on a group/team name.
- **Bijan Choobineh:** Worked with advisors to set-up weekly schedule for meetings. Started looking at tutorials regarding machine learning and GPU. Reviewing the project specifications and trying to tie in specifications to what was being seen through the tutorials. Will continue to work through tutorials to get a better understanding of machine learning.
- **Darren Davis:** Secured team meeting location for coming week. Setup second email list for team based on team name and added advisors. Continued reviewing information given by client and started looking at information given by advisors.
- **Tracy La Van:** Worked on group weekly report information for the team, took meeting minutes, helped team leaders coordinate meetings with advisors, Dec1710, and client (sent emails and information out). Began looking at tutorials from client and course from advisor.
- **Jesse Luedtke:** Studied and looked at multiple tutorials given to us by the client and our advisor.
- **David Schott:** Spent most of the week recovering from an illness. Attended meeting with advisors and reviewed notes in an attempt to catch up on missed client/team meetings.

- **Robert Stemig:** polling group for team name, Decided on ALVINN (Autonomous Learning Vehicle Integrating Neural Networks). Continued looking at the tutorials given by our client on neural networks. Started viewing udacity tutorials given by prof. Jones.

Pending Issues:

- **As a Group:** Need to hear back from client about NDA. Need to hear back from advisors about project details after they meet with the client. Need to find out if Josh needs to be added to alvinn@iastate.edu or not.
- **Bijan Choobineh:** Will need to communicate with client on details of weekly meetings. Once we have more project details, will need to focus learning and research on the appropriate topics if they change.

Plan for Coming Week:

- **As a Group:** Will work on getting project specifics written out after the advisors and client meet on Tuesday. After specifics are worked out, group will brainstorm what all we believe we will need to do in order to accomplish the project. Two meetings have been scheduled for the next week: one with advisors and one with client. Due to the Career Fair this next week, a virtual team meeting has been scheduled for Wednesday evening.
- **Bijan Choobineh:** Continue working with client/advisors on any concerns that may come up. Will continue to work on tutorials provided and other research to gain a better understanding on topics such as machine learning which will be necessary for this project.
- **Darren Davis:** Setup meeting locations for the following week. Continue reviewing provided information and find other relevant information to project.
- **Tracy La Van:** Will continue working on the tutorials from the client and looking at the course from the Dr. Jones. Will prepare the weekly report for the next week and take meeting minutes.
- **Jesse Luedtke:** Planning on getting some experience with TensorFlow, an open source library for machine learning.
- **David Schott:** Will work on being healthy and begin looking at udacity tutorial + TensorFlow
- **Robert Stemig:** Continued use of tutorials on machine learning, as well as reading more on neural networks. Try to get some time with tensor flow, and applicable/compatible boards.

Individual contributions:

<u>NAME</u>	<u>Individual Contributions</u>	<u>Hours This Week</u>	<u>Cumulative Hours</u>
Bijan	Coordinated meetings with advisors, tutorials, reviewed possible project specifications	8.0	10.5
Darren	email list, meeting locations, team name, review websites and tutorials	7.0	9.5
Tracy	Team name, helped coordinate meetings/emails, weekly report write up/submission, email advisors weekly report	6.0	8.5
Jesse	Studied information given on machine learning	5.0	7.0
David	Sick, advisor meeting, installing TensorFlow for Python	2.0	4.0
Robert	Team name, began udacity tutorials on machine learning,	5.0	7.0
Totals:		33.0	46.5

Comments and Extended Discussion:

Note for this week: David was unable to put too many hours into the project due to illness that kept him off his feet. Even though he was unable to log many hours, this did not hinder the group in any manner and he still finished everything that was required of him.

Summary of Weekly Team Meeting (2/2/2017):

- Present: Bijan Choobineh, Darren Davis, Tracy La Van, Jesse Luedtke, David Schott, Robert Stemig
- Team names proposals will be open on Slack until Friday at 5pm
 - [#team_name](#)
- **Robert** will create a poll to decide on a team name to be completed by Saturday
- **Darren** will take the new team name and create a mailing list including the 6 group members and two advisors
 - Add Josh on mailing list as well?
 - ALVINN - alvinn@iastate.edu
- **Darren** will find a room to reserve on campus for our meetings with Josh
 - 2-3pm Thurs 2/9 - Room 4 in library basement (down the main stairs, into the media room on the left, and then hang a left again and head towards the corner of the room)
- **Bijan** will email the client to find out what method will work best for client meetings
 - iMessage, Hangouts, or Skype (iMessage may be best for resolution/sound quality?)
- **Tracy** will email professors to get additional links to materials
 - **Everyone** needs to begin looking at tutorials and info, if you have not done so already:
 - [Background Info & NVIDIA Tutorials](#)
 - [Sample Video Board](#)

- [Udacity](#)
- **Bijan** will send an email to advisors on Tuesday around 3pm to request a meeting recap from their meeting with Rockwell Collins
- **Everyone** needs to enable Slack notifications on their computer and/or phone for easy communication
 - **Darren** will follow up and make sure this has been done by everyone by Sunday
- **Jesse** will ensure Dr. Zambreno brings us cookies next week for missing our meeting
- Next meeting *tentatively* scheduled for Wed 2/8 in the evening via Skype (details to eventually follow) to go over what we learn from the advisor/client meeting and to prepare for Thursday's client meeting
- Reminder: No class next Tuesday - Good luck at the career fair!

Summary of Weekly Client Meeting (1/31/2017):

- Present: Josh Bertram, Bijan Choobineh, Darren Davis, Tracy La Van, Jesse Luedtke, Robert Stemig, some members of Dec1710
- Absent: David Schott
- Introductory slides (RC & what they do, why they want the project)
 - [IowaStateSeniorDesignKickoff.pdf](#)
- He will look over NDA information (he took the form to look over)
- Need to figure out what to do about this "contest" - Geiger's idea?
 - Josh is really for doing a contest - group still seems to have mixed feelings about this (need to discuss further with advisors)
- Cameras: scans as it goes like a monitor does; other one is rolling shutter (vs. ??) jello effect [sorry guys - he was talking really fast here and I didn't catch it all]
 - No more than 400 feet above ground (run trig to find best resolution needed for camera) - how close are you worried - how far away? Trade off problem (best effort problem) - power usage preference? (under 491/492 no; real world yes) - size constraints (he will come up with that)
- Two boards - NVIDIA (tegra chip and I/O) Jetson TK1/TX1 (TK1 board worked well, not on TX board) like a Raspberry PI
 - Consider only TK1 boards - promising results RC may chip in for special boards
 - See Weekly Report 1 or Project Description for link to NVIDIA board
- GPS on plane - capability of very precise known location (+/- 3 meters - ish)
 - U of I has toys we could possibly play with if we have working software (working prototype this semester - like train it against map of Iowa City area) - on the table as an option
- Pick scope and then narrow it down to what we want to do (talk to advisors about this)
- Best way to reach out to Josh - email: josh.bertram@rockwellcollins.com
- Hangouts bi-weekly meetings 2pm (Group meet where? Maybe Durham Atrium still?)

Summary of Weekly Advisor Meeting (2/2/2017):

- Present: Dr. Jones, Bijan Choobineh, Darren Davis, Tracy La Van, Jesse Luedtke, David Schott, Robert Stemig

- Absent: Dr. Zambreno
- Drs. Zambreno & Jones will meet with Josh next Tuesday to hammer out details
 - Probably early afternoon
 - Will get us details prior to Thursday meeting
- Budget - traditionally, 491/2 offers \$500
- Most likely be able to use the Jetson platform
 - They'll be able to get these for us and help us learn how to program them
- Udacity (email him for link)
 - <https://www.udacity.com/course/machine-learning--ud262>
- Meetings 3-4pm weekly with advisors
 - Dr. Jones will take care of reserving a room
- Create a mailing list with our team name with our 6 and advisors
 - Darren will do (after we have a name)
- Cuda, Matlab, OpenCV, TensorFlow
 - <https://developer.nvidia.com/cuda-downloads>
- **TODO:** Team name, mailing list, email requesting Udacity, email advisors Tuesday evening for a recap of their meeting with RC, check out NVIDIA CUDA, *TUTORIALS!!!*