

## EE/CprE/SE 491 Weekly Report 4

Group: sddec19-14

Client & Advisor: Danfoss Power Solutions(Radek) / Dr. Alexzander

### Team Members:

Omar Abbas - meeting scribe/report manager

Dennis Xu - chief engineer/meeting facilitator

Aaron Michael - chief architect

Jonah Bartz - continuous integration

## User Information Augmentation

3/1 - 3/8

### Weekly Summary:

After acquiring the parts we needed, we have now begun assembling them. The Tobii eye tracker was successfully installed onto a Windows x86 system but when we tried to install it to an ARM-based system, there were many more complicated steps. One issue we have run into is that we couldn't find some libraries for an ARM system. We only had ones for a x86 system. After overcoming this phase and configuring the setup, we plan to begin our first test phase.

We also ran into the issue of our USB hub malfunctioning. This was preventing us from using a keyboard and a mouse since the Jetson only had a single USB port. In order to work around this, Dennis installed a VNC client in order to control the Jetson through another computer.

In addition, we are now in close contact with the VRAC on campus and have set up a time to go and see how they have their system set up. Currently we are working out how we would integrate the Jetson into a moving vehicle. Included in this report are pictures of how the Tobii eye tracker looks and how the Nvidia Jetson TX2 is hooked up to the display monitor. This is a just a basic setup that could be changed depending on our final setup. In addition, we have included a picture of an OpenCV test using an onboard camera. This features 4 different views, including an edge detection mode that will assist us in object detection.

### Past Week accomplishments:

Omar Abbas: More OpenCV tutorials. Set up time to visit VRAC and look at their setup. Consulted Dr. Stoychev who is currently teaching a graduate level class that focuses on object detection.

Jonah Bartz: Began research into Tobii development to see how we can program the eye tracker to do the functions we want. Also looked into different carrying boards for the Jetson. A big issue we see is the lack of ports. With 2 cameras, a projector, and an eye tracker there are

limited ports to plug into so we found some available ports as well as compatible cameras (Auvieda, and TaraXL) that are both compatible for Nvidia Jetson Tx2.

Dennis Xu:

- Got a basic version of VNC working so we can control it remotely
  - Added to documentation how to use VNC
- Worked together with everyone to try to get the Tobii Eye tracker working
  - We found some compatibility issues doing this
- Created a preliminary sketch of a possible physical design

Aaron Michael:

- Worked with the rest of the team to get the Tobii Eye Tracker 4C to integrate into the Jetson TX2 system.
- Looked into Transmission Control Protocol/Internet Protocol as a way to get around the issue of the libraries for x86 Windows on the Linux ARM architecture.

## Pending issues:

- The USB hub we were using stopped working
- Learning OpenCV library which will allow us to perform image detection using the TX2.
- Connect Tobii eye tracker to the Jetson in order to trade information.
- Use OpenCV to detect objects in front of the TX2, and use Tobii Eye tracker to determine whether the person saw the object or not.
- The Tobii Eye tracker has libraries for x86 and we are not sure if we can get ones for ARM

## Individual contributions:

Name	Individual Contribution	Hours this week	Hours Cumulative
Omar Abbas	More OpenCv tutorials. Set up time to visit VRAC and look at their setup. Consulted Dr. Stoychev who is currently teaching a graduate level class	4	12

	that focuses on object detection.		
Jonah Bartz	Worked with the client on ordering more hardware such as carrying boards and cameras to connect to our Jetson.	4	11
Dennix Xu	Worked on getting a basic setup for VNC and started work on the tobii eye tracker with everyone	4	11.5
Aaron Michael	Talked with someone in industry about using TCPIP for our project. Assisted with the attempt to integrate the Tobii 4C into the Jetson Linux environment.	5	12

## Plans for upcoming week:

We have three goals for this upcoming week:

- 1.) We want to have our design diagrams finished for the first iteration of the design project. We want to have a documented design pattern that we can work towards so that once we get all the individual components hooked up we can put them together easily, and hopefully detect any future complications.
- 2.) We want to get the Tobii eye tracker connected to the jetson. We have the Tobii eye tracker fully working; however, it is only working on Windows operating systems right now. We have to get the Tobii libraries incorporated into Linux so that they will work with PyGaze and the jetson. This will take the full Tobii functionality on the Jetson and allow us to write custom programs.
- 3.) We want to continue working on learning about object detection.

## Pictures:

