

Steven Heinisch

 projects.vrac.iastate.edu/REU2016/people/interns/steven-heinisch/

Blog Post #31 – 26 JUL 16

Posted on [July 26, 2016](#) by [heinisch](#) July 26, 2016

I haven't been feeling up to blogging lately, which is why my last one was almost a week ago. Yesterday we had our teleconference with the REU interns at USC and presented our research. Our presentation went very well, and Angelica said she believes our and Biosensors' presentations were much better than the presentations from USC, so that was a confidence booster. This, by the way, was achieved despite our lack of results.

It is now Tuesday in week 9 and Team Wireless EEG finally, finally conducted our very first wireless EEG test. It has become clear that we will most likely not get to testing gait because, despite how much more efficient the Wireless EEG is supposed to be, it took nearly as long to conduct it as the wired Biosemi. We were only able to get one test done, so it may take the rest of the week to test Sam, Zoe, and Kayla. We have to do this and compare the results to verify whether or not the Wireless system gives good data all by the time our poster is due Monday.

I am pretty excited to go home and see everyone that I have been missing for so long. I honestly cannot wait.



Blog Post #30 – 21 JUL 16

Posted on [July 21, 2016](#) by [heinisch](#) July 21, 2016

Between yesterday and today we continued data processing using EMSE. Even though Team Wireless EEG was all there, it really only takes one person to do it effectively. So, between yesterday and this morning I finished all of the data processing myself. Yesterday I asked Andrew what the difference between the EMSE processing and what we were supposed to build was and his response was "nothing". I wonder why they were making us build it if we were just going to use EMSE anyway.... maybe they were just keeping us busy.

I came late to the luncheon lecture as a result of finishing the data processing. Despite my tardiness, this may have been one of my favorite lectures! The speaker, Rick Stone, reminded me of a rigid military soldier with a humor edge. His topic was on welding, and he was so engaging that I almost wanted to take it up.

Blog Post #29 – 20 JUL 16

Posted on [July 20, 2016](#) by [heinisch](#) July 20, 2016

It is now the 20th of July, and we are less than three weeks away from being back home. I can honestly say that I am looking forward to that. I've learned so much here and meet some interesting people, but it has been a long 7 1/2 weeks and I would like spend the rest of my summer with my roommates back home before we all split up. At the same time, it somehow feels like this program has flying by. I don't really know how to explain it.

As we're nearing the end of the program, Team Wireless EEG has been getting ready to prepare our poster and give a presentation of our research other REU students at USC. the only problem with this is that we haven't yet been able to take any wireless EEGs... which means we are still several steps removed from getting any results. This is

not because of anything we have or haven't done, so we just have to wait until the device is ready.

Blog Post #28 – 15 JUL 16

Posted on [July 15, 2016](#) by [heinisch](#) July 15, 2016

Yesterday we had our first Ethics course with Eliot. He started off with a pitch that we should immediately reduce the population of Earth by 1/3. These are the kind of controversial topics we will be discussing in these classes. While these topics are interesting and I enjoy discussing them, I am struggling how exactly this is relevant to what we are here for other than learning how to deal with tough situations in the workplace. I just hope it doesn't turn into a means of pushing certain political ideologies.

This morning Andrew was feeling under the weather, so we let ourselves into the lab. We got a little bit of work done before coming back for Team Team Tutoring's presentation in Journal Club. They actually switched which article they were presenting (seemingly without telling anyone), so I did not know I was reading the wrong article until 30 minutes before the discussion. Luckily they had a good presentation and the material was easy to grasp so I was able to contribute to the discussion.

Blog Post #27 – 14 JUL 16

Posted on [July 14, 2016](#) by [heinisch](#) July 14, 2016

Seems like my blog posts this week are going to be very redundant. Once again, we started our day at Forker to continue working on data processing. Team Wireless EEG was so busy processing that we ended up missing most of the Luncheon Lecture, but I would argue that doing anything related to our research holds priority over anything else. That's about all that's happened between yesterday and today, and I'm sure I could pretty much copy and paste this into tomorrow's blog and it would accurate.

Blog Post #26 – 13 JUL 16

Posted on [July 13, 2016](#) by [heinisch](#) July 13, 2016

Not many interesting things to talk about this week. Team Wireless EEG has been spending most of our time in Forker as opposed to VRAC, which gives us a better workspace in terms of data processing. Yesterday we also planned on getting our first data collection using the wireless EEG, but ran into a complication that will not be resolved until next week. Surprisingly, wearing the wireless headset was actually more uncomfortable than the standard, wired headset, despite the one of the points of the wireless being more comfortable and easy to use.

This morning we, again, went over to Forker to work on data processing. Samantha continued data marking on Motion Monitor to find the amplitude and wavelength of our signals while Zoe and I built these functions into our program. To our relief, our program gave us similar results to the Motion Monitor. The reason we are building this program is because part of Motion Monitor relies on simply "eye-balling" and guessing, which is something we can get rid of by building our own program and thus get more accurate results.

Blog Post #25 – 12 JUL 16

Posted on [July 12, 2016](#) by [heinisch](#) July 12, 2016

After blog time yesterday Team Wireless EEG went over to Forker to continue data processing. Samantha processed our data using the existing software (Motion Monitor) while Zoe and I continued building our own data processor. Zoe and I were actually able to finish our program and made it work for all of the data that we have! At this same time, Samantha also finished doing the data processing with Motion Monitor, so we got a lot done!

Today our Luncheon Lecture speaker was Stephen Gilbert, PhD. who is the professor for Team Tutoring and also helps run the REU program. His presentation was actually the same one he pitched to Iowa State in 2012 to convince them to put him on tenure track. It was interesting to see where he was in his Team Tutoring research and how far along he has come.

Blog Post #24 – 11 JUL 16

Posted on [July 11, 2016](#) by [heinisch](#) July 11, 2016

This weekend was a great time! It began at Skyzone, which is one of those indoor trampoline parks that had dodgeball, basketball, and a foam pit. I had never been to one of these before, so it was a great time!

From Skyzone we went to a restaurant called Zombie Burger. Out of their 20+ specialty burgers, I chose the “Elvis Burger” which had three patties, bacon, peanut butter, fried bananas, and an egg on it – needless to say I did not finish it...

Saturday night I had a very interesting first-time experience that I will be happy to elaborate upon in person. Sunday was spent relaxing.

Today for lunch, instead of going to the UDCC, we went over to the MU for an “etiquette lunch”. I thought it was going to be some sort of general professionalism seminar, but it was actually about “General Rules for American Dinner Etiquette”. The whole setup was very fancy and particular, and we learned about how to properly behave at a fancy dinner. I almost felt out of place, but it was a learning experience nonetheless!

Blog Post #23 – 8 JUL 16

Posted on [July 11, 2016](#) by [heinisch](#) July 11, 2016

Believe it or not, rock climbing last week negatively affected my leg workout more than my arm workout. Last week I disappointingly under-performed in some of my my let workouts, hoping it was simply due to rock-climbing directly prior. Luckily, after working out legs yesterday (starting fresh) I am relieved to say that it was just the rock-climbing that messed with my workout, so I won't make that mistake again.

Today we just had time to work from 9-11 and journal club from 11-12. This week it was the Cognitive Assistant team's turn, and they provided a very stimulating discussion that facilitated participation from everybody. We got much more insight into what exactly their team is working on, and it is very interesting! Their project was actually my first choice, but after being here for 5 weeks I am glad I ended up on Team Wireless EEG.

Blog Post #22 – 7 JUL 16

Posted on [July 7, 2016](#) by [heinisch](#) July 7, 2016

Happy Bungie Day!

Following my last blog post, Team Wireless EEG headed over to Forker to meet again with Andrew. This time we started using Motion Monitor to learn how to process the data and were challenged to build a similar piece of software that can process the data more accurately. Zoe, Sam, and I will be working on this program for the next few days and hopefully have it done by Monday or Tuesday! Also, this meeting ran late so I did miss our on helping David present our Deeper Dive project, but it looks like we won!

This morning we started off our day at Forker working on our program until about 10:40 before coming back to VRAC to attend the Luncheon Lecture with Dr. Danielson. While his presentation's format was consistent with the other lecturers' in that he had a structured PowerPoint that outlined his research, he did spend time at the beginning

getting to know each of us and our backgrounds.

The rest of the day shouldn't be that bad, as we just have Craft of Research, some more programming to do, and then leg day with Stanley. I'm pretty tired so I hope it goes by quickly!

Again, Happy Bungie Day. That phrase has more meaning to me than I have energy to explain right now, but maybe I will come back later and talk about it.

Blog Post #21 – 6 JUL 16

Posted on [July 7, 2016](#) by [heinisch](#) July 7, 2016

Yesterday Team Wireless EEG headed over to Forker for our weekly meeting with Dr. S to talk about articles we read. Our articles were inspired by EEG filters, which were meant to help us further understand them. While some insight was offered within these articles, it was hard to grasp all of the mathematics behind them.

Today we went to a talk called "How to Apply to Graduate School". This presentation, as you might guess, covered topics ranging from standard requirements, admission processes, and resources. Much of this presentation was common sense, but overall I do think it was helpful.

~Steve

Blog Post #20 – 5 JUL 16

Posted on [July 5, 2016](#) by [heinisch](#) July 5, 2016

Considering Friday was a half day and that Monday was a holiday, it has been awhile since I blogged. The night following my post on Thursday was pretty interesting. We went to Lied Gym where I started off with rock climbing and eventually moved into wrestling. After that, Stanley and I met up with some other people and went out to campus town. Apparently Thursday is "mug night": a weekly event where if you bring a 32oz mug to certain bars you can get certain drink specials. It was great to meet some new people and have a night out!

Friday was a short day and only really consisted of working David and I working on our deeper dive project.

For dinner Saturday most of us met up in Stanley's room, each bringing our own homemade food to contribute to a potluck dinner. There was an interestingly wide range of food, and everything was really good!

As for Sunday and Monday, I didn't do much other than go to the firework show on Sunday. The show wasn't bad and the weather was great, so I can't complain.

Today we finally get back into the swing of things with our regular schedule, although the lack of our normal Tuesday morning meeting and luncheon lecture is giving us plenty of time to work. We do have a meeting and 2pm, so I hope we finally get to start testing the wireless eeg headset.

~Steve

Blog Post #19 – 29 JUN 16

Posted on [June 29, 2016](#) by [heinisch](#) June 29, 2016

Not much to say in this blog post. After my last post we had time to work until 5 pm, then I went home to wind down for the rest of the night.

This morning we continued our “Deeper Dive” topic, finishing the course on GPU parallelism. This time, we talked about shared memory, synctreads, and more about threads. Going into the 2pm lesson, I have to have a topic in this area ready to begin working on, which we will have one session today and two on Friday to develop. While I understand the concepts pretty well, turning that into code using syntax I never have before will be a challenge.

That pretty much all there is today between my last blog post and now.

~Steve

Blog Post #18 – 28 JUN 16

Posted on [June 28, 2016](#) by [heinisch](#) June 28, 2016

Yesterday afternoon we continued our deeper dive topic, attempting to grasp the idea of parallel computing over sequential computing. This wasn't too difficult from a conceptual standpoint, however trying to learn the syntax of programming the GPU on top of that was challenging.

The rest of Monday consisted of Andrew stopping by to check up on us; Zoe, Sam, Angelica, and I rock climbing; and Stanley and I lifting. Zoe is a competitive rock climber, so rock climbing with is a challenge, but it definitely helps me improve!

Today we didn't have a team meeting this morning, so we went to the VRAC at 9 to start our workday. Leading up to our Luncheon Lecture, we were able to finish our Literature Review and begin our Methods section.

The Luncheon Lecture, presented by Senior Lecturer/PhD candidate Sherry Berghefer, was definitely one of the more interesting ones. Her main focus is studying how effectively people can distinguish real images from altered images and created images. She even used an eye tracker to track the movement of the subjects' eyes while they were looking at the images!

Usually we blog right after the Luncheon Lectures, but this time we had to go straight over to Forker to perform an EEG test on Kayla. This is everyone's third time helping with the setup, so we are starting to get the hang of it. We even had middle schoolers come observe and help with a small portion of the setup, which was great because, as Sam said: “If anything goes wrong we can just blame the little kids!” (Morris 2016).

~Steve

Blog Post #17 – 27 JUN 16

Posted on [June 27, 2016](#) by [heinisch](#) June 27, 2016

It seems like forever since I got to sleep in both Saturday and Sunday, but this past weekend was finally one of those times. I used Saturday to catch up on sleep all the way up until we had to leave for the Art Festival in Des Moines, in which Karen was showcasing some of her art. The evening was loosely structured in that we were free to roam around, check out the art, eat, and do anything else until 7. There was a lot of amazing art to admire, but most of it was out of my budget. The rest of Saturday and Sunday were spent at the apartment bathing in the abnormal amount of free time I was given.

This morning I woke up with a bad case of homesickness. This is the first time I have felt this since I have been here, and the more I thought about it the worse it became. My two best friends and I have been renting a house together since October 2014, but will be splitting apart at the beginning of this September. They are moving to California and I will be moving to Madison, WI for school, so it has been very difficult spending my entire summer here when I know that after August I will not see them for a very, very long time. I am having an excellent experience here, but it is just a shame that I am unable to spend 10 out of the last 14 weeks I have with them. Taking the plane here instead of my

car was a mistake.

Anyway, we had another Deeper Dive course today. This time we switch from shaders and moved into C++ dynamic memory allocation. I took Data Structures (C++) Fall 2015, so I already understood how pointers worked (and I'm sure everyone else did too), I just had a bit of trouble writing the remove function for a Linked List, but I eventually got it to work.

~Steve

Blog Post #16 – 24 JUN 16

Posted on [June 24, 2016](#) by [heinisch](#) June 27, 2016

Yesterday we spent the first half of Craft of Research going over the general process of writing and submitting IRB Applications, which is essentially explaining potential risks to subjects of your experiment. Luckily for Team Wireless EEG, our professor had taken care of this before we even got here, and I am thankful for that because according to the other groups it seems like a lengthy and tedious process.

The rest of Craft of Research consisted of reinforcing our knowledge of writing the Introduction, Methods, and Literature Review portions of our research paper. We also learned which Deeper Dive Groups we were assigned to, and I got my top choice (Unity Shaders)!

We began today with our first course in our Deeper Dive topics. The Unity Shaders group was given an intro to the process of projecting a 3D object to the 2D computer screen and learned about how developers use shaders to increase the quality of their graphics, and it was awesome to actually start learning how to do that!

Next was Journal Club, which was ran entirely Team Wireless EEG presenting our article, facilitating conversation, and answering questions from the other interns. We had to fill up about 50 minutes worth of time, and based on the feel of the conversation (as well as Angelica's feedback) we did an excellent job.

~Steve

Blog Post #15 – 23 JUN 16

Posted on [June 23, 2016](#) by [heinisch](#) June 23, 2016

We finally wrapped up Unity yesterday by delving more into animation and scripting. It was cool to see the development from where we started to where we ended, and I was able to get a better idea of how legitimate game development companies could use the Unity engine for their games. During this session, we also went over the deeper dive topics, two of which involve Unity and the other 3D-printing. I should found out which one I get into today or tomorrow.

Today being Thursday, we took another EEG to gather more data, this time from Zoe. Unlike the other two times, we were unable to run the tests right away because of some of the electrodes were either blocked or did not have enough gel on them. It was cool to see Andrew diagnose and solve the problem, and I believe I could do the same if it happens again.

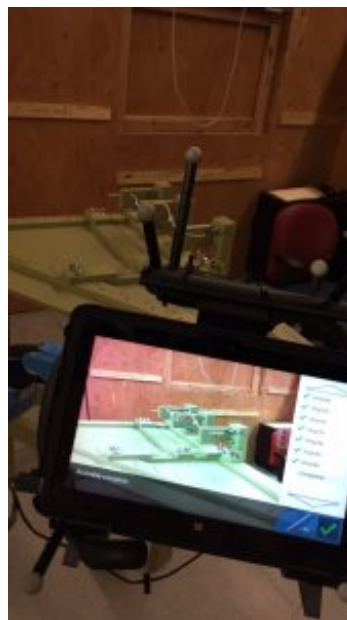
Additionally, we had another Luncheon Lecture today. The speaker was associate professor Dr. Adarsh Krishnamurthy, who spoke about how the differences in CPUs and GPUs affect 3D modeling.

~Steve

Blog Post #14 – 22 JUN 16

Posted on [June 22, 2016](#) by [heinisch](#) June 23, 2016

Immediately following my last blog post I went over to the Engineering building to be a participant in the study I signed up for. I didn't really know what I was getting myself into, I simply signed up because they recommended us to help with these studies. I walked in to see a construction table, wooden parts, and a shelf full of bins with nuts, bolts, and washers. My task was to assemble a "plane wing" using augmented reality instructions. Essentially, there was an iPad mounted on an arm that extended from a stool that I could wheel around. The iPad's augmented instructions included a sidebar with the steps, and used the camera to display what was in front of the iPad on the screen. During each step, the iPad would display yellow boxes around what item I needed to pick up, and virtually displayed those items on the work table showing where I needed to put them. I was surprisingly accurate and I really enjoyed being a subject in this study, as well as getting paid for it. Here is a picture of the mounted iPad as well as a picture of the UI (the latter was taken after I finished the entire assembly so it does not show the displays).



Participating in this study took up most of the rest of the work day, so other than watching *Black Swan* later with a few of the interns, the rest of the day was not very eventful.

Leading up until now, the only thing we have done today was continue our course in Unity. Karen took over teaching the course and showed us how to write scripts that manipulated an object based on a user input. For example, we were able to change the lights between red, green, and blue by pressing R,G, and B. This is a very simplistic function, but it is the first step towards more complex object interactions that can make up a game. I will probably end up choosing Unity for my “Deeper Dive” topic, so I hope I get a spot!

~Steve

Blog Post #13 – 21 JUN 16

Posted on [June 21, 2016](#) by [heinisch](#) June 23, 2016

Yesterday we wrapped up the workday with a continuation of our introduction to Unity. This time, we focused on using scripting to begin animating our objects as opposed to simply building them. Seeing a visual output based on what you programmed on the back-end was extremely satisfying, and I cannot wait until class on Wednesday to continue exploring this. Based on everything we have done thus far, I am trying to determine whether I would rather choose Maya or Unity for ‘Deeper Dive’, but I am leaning toward Unity.

After our course, we had one hour left in the workday to work on whatever we wanted. Andrew, our graduate mentor, stopped by to see how we were doing on our EEG program. This program is supposed to read in EEG data, filter it, and run an FFT test so that we can get reliable data. We were having a lot of trouble, so Andrew gave us a few pointers. This conversation continued this morning during our official meeting with Andrew and Dr. S. Apparently, there is something called “EEG Lab”, which provides the functions for most of the filters we were having trouble with, so this is something we plan on looking into and utilizing in the future.

Aside from that, during our meeting we each presented our own articles that we had found regarding EEG. This week’s discussion went much more smoothly than last week’s, so it seems like we are becoming more fluent on the topic. My particular article also happened to be the one Team Wireless EEG will be presenting on Friday during journal club, so it was nice to get a head start and get some practice discussing it.

We then came back to VRAC for our fifth Luncheon Lecture, which was hosted by another cognitive psychologist: Dr. Jonathon Kelly. His recent work seems to be focused on spatial recognition and depth perception in virtual reality. The content of his discussion was parallel to that of the article we had to read for Craft of Research last week in that for some reason people are generally less able to judge distances in VR as opposed to the real world.

Lastly, I made a last second decision today to sign up as a subject of research from 2-4 today. The interns have been encouraged to sign up for these, but I don’t think that anybody has yet, so it will be interesting to get the first look at it! (The \$20 is also encouraging.)

~Steve

Blog Post #12 – 20 JUN 16

Posted on [June 20, 2016](#) by [heinisch](#) June 23, 2016

On Friday we had our last Solidworks course, and I can’t say I’ll miss it. Solidworks seems like a very powerful tool, but was not intuitive to learn compared to Maya. I would learn it if I had to, but I definitely will not be choosing it for our “Deeper Dive”.

This weekend was definitely an exciting one, as Stanley and I went to Cafe Beaudelaire for a few drinks. Saturday we had to get up early to go to a challenge course where we did many entertaining team-building activities. My favorite part was definitely the rock climbing, followed by the giant swing. We were there all day (9-4) so I took a long nap when I got home, and relaxed for the rest of the night.

Sunday was the first day in awhile that I had no responsibilities, so it was nice to have that break, although Team Wireless EEG did meet up at VRAC to get ahead on our work. We came back to Freddie to see that Stanley had made teriyaki chicken and jasmine rice for everyone! It was great to hang out with everyone, eat, and watch Game 7 of the NBA finals! The game was very close, but Lebron was able to pull off the win!

This morning we had our first course in Unity, which is a gaming engine. We started off with some simple modeling, similar to Maya, and we will soon move into using C# to create animations. I am very excited to get into Unity, and am considering choosing it as my deeper dive topic.

~Steve

Blog Post #11 – 17 JUN 16

Posted on [June 17, 2016](#) by [heinisch](#) June 23, 2016

After my last blog post yesterday, we went straight into our Craft of Research meeting. Having read section II (*Asking Questions, Finding Answers*) along with *How to Write Your First Paper*, this meeting covered the importance of choosing a topic, structuring your paper, and citations, so although this was the most entertaining meeting, it was definitely necessary.

We then went back to Fredericksen Court to change and get ready for frisbee golf. Given the choice between frisbee golf and volleyball, I definitely cast my vote for volleyball but was sadly in the minority. My skepticism of frisbee golf waned after the first “hole”, as I turned out to be better than I thought I was going to. Having never played it before, I assumed I was going to be too bad at the game to have any fun, but that was not the case. The rest of the day was filled with typical relaxation and reading.

This morning we continued our Solidworks course, which didn't end up being as bad as Wednesday since we actually got to build parts instead of follow a poorly written tutorial. That said, I am still not a big fan of Solidworks and am looking forward to not doing it again after today.

~Steve

Blog Post #10 – 16 JUN 16

Posted on [June 16, 2016](#) by [heinisch](#) June 23, 2016

After blogging yesterday we began our course instruction in Solidworks, which is another modeling software similar to CAD and Maya. In all honesty, I did not enjoy Solidworks very much, especially after coming off a Maya high. It seems like you can do some pretty neat things with Solidworks, but it is not at all intuitive and has a much steeper learning curve than Maya. Hopefully I will start to pick up on it as we have our remaining two courses tomorrow.

To close out the workday, Team EEG wrote up a rough draft of our “Problem Area Paragraph”. Stanley and I then went lifting, and then I ended my night by reading some of the articles we have assigned.

Today Team EEG awoke earlier than everyone else and made our way to Forker for our second data collection session. This time Sam was the subject, so I finally got to get a hands-on experience with setting up the EEG. Everything went extremely smoothly, as we were able to set up, run tests, and break down about 45 minutes faster than we did last week.

Lastly, we just had our fourth “Luncheon Lecture”, this time with Dr. Veronica Dark. Dr. Dark is a psychology professor here at Iowa State who specializes in cognitive psychology. Her presentation was definitely one of the more structured of the four, but she did an excellent job of tying in basic psychology concepts with Human-Computer Interactions.

That just about covers everything between my last blog post and now.

~Steve

Blog Post #9 – 15 JUN 16

Posted on [June 15, 2016](#) by [heinisch](#) June 23, 2016

Following my last blog post, Team EEG had another meeting with Dr. S and Andrew – this time from 2pm-4pm. The purpose of this meeting was to have a Skype session with Mike Chi (Wireless EEG headset representative?) to learn how to properly put on the headset. As it turns out, our headset actually has wiring issues, so we are in the process of mailing it to Mike to get fixed. While disappointing, this will not set us back at all since we weren't going to start gathering data from it for another two weeks.

For the rest of the work day, Team EEG started to work on making the data analysis program (Or as Dr. S calls it: "Writing a code"). We will be using MATLAB and Java, which are two languages that I have absolutely no experience with. That being said, it will be tough, but I am here to learn!

After work we had another quick extracurricular activity! This time we went across the street into a studio to perform "Light Painting". Essentially, with the studio dark, you move your light source about the air in front of you and the camera will produce a single picture or 'painting' that shows wherever you moved your light source. Since each team is comprised of 3 people, Team EEG naturally painted the letters "EEG". I also had to other people help me paint my fraternity letters, so I'm excited to see the pictures when they are posted!

This morning, we had our last course in Maya 3D modeling, which consisted of adding lighting and textures to our objects. These tools are essential because they bring your models to life, but I find it more interesting to create the models themselves.

For the rest of the day, we will start learning Solidworks, Stanley and I will be going to the gym, and I will work on reading some articles for the meetings we have tomorrow and Friday. We'll see how it goes!

~Steve

Blog Post #8 – 14 JUN 16

Posted on [June 14, 2016](#) by [heinisch](#) June 23, 2016

Yesterday we did not have anything scheduled apart from blog time and Maya course instruction. We dove into more features of Maya to help morph and change shapes into more detailed and customized objects. It was fun using these new techniques to continue expanding upon what I had already created, and I'm looking forward to our final course in Maya on Wednesday. After work, Stanley and I went to the gym, then I ended the night by reading some articles for our EEG meeting. A lot of the language and concepts were new to me so they were difficult to grasp, but I look forward to becoming more fluent in that area of study.

Today began with our first real sit-down meeting with Dr. S. We talked about the articles we had read, went over our approach to the project, and learned how we should structure our code. It all seemed a bit overwhelming, but as we get into the swing of things I will get more comfortable.

Additionally, we had our third "Luncheon Lecture" today – this time with Dr. Ming-Chen Hsu. He put on a more formal presentation compared to the previous two speakers, showing us what kind of things he works on. He has been on some very interesting projects, such as working to create a more optimized replacement heart valve. After his presentation he encouraged us to go to graduate school, but also reminded us that we need to be prepared for the challenge that comes with it.

As I wrap up this post, Team Wireless EEG is preparing to go back to the lab to have a Skype sessions with a colleague of Dr. S, who will educate us more on our Wireless EEG headset.

~Steve

Blog Post #7 – 13 JUN 16

Posted on [June 13, 2016](#) by [heinisch](#) June 23, 2016

Monday is once again upon us, marking the end of a relaxing weekend and the beginning of a long week. We closed out last week with our final lesson on C++, wherein we learned about inheritance. This is a concept that I have not yet encountered in C++, so it was nice to finally get into something new! After work, all I did was go back home and watch the NBA finals – it was nice to stay in, which is a theme that pervaded throughout the rest of the weekend.

Aside from the Farmer's Market Saturday morning – which was enjoyable – I spent most of my time both Saturday and Sunday resting my mind after the long week prior. It was nice to take the weekend off, although I did catch up on some readings that needed to be done.

This week we have switched from learning C++ to Maya, which is a 3D modeling software. I have never done anything like this before, but it's actually very fun and I think I'm picking it up rather well! There is some mathematics involved, which makes it interesting for me, and I hope that the more we learn the more math we will use!

That covers everything between my last post and now.

~Steve

Blog Post #6 – 10 JUN 16

Posted on [June 10, 2016](#) by [heinisch](#) June 23, 2016

We kicked off yesterday afternoon with our Craft of Research meeting, the main message of which was **do not plagiarize!** As we learned from the articles we had read (as well as previous knowledge), committing plagiarism can result in serious repercussions up to and including jail-time. Apparently you can even plagiarize yourself, so always cite your sources!

After our workday we took to the gym to get some exercise. Stanley and I have started to lift regularly, so I decided to earn my exercise a bit more recreationally by rock climbing. It was definitely a great time and nice break from the work we've been doing!

Today began with another C++ course, wherein we got into classes/objects and inheritance. Although I've worked a lot with classes, I haven't gotten into inheritance yet so it's great to finally start learning something new!

Lastly, today we discussed and analyzed an article during Journal Club. Angelica went through the article with us, explained the fortes and faults of it, and gave us tips on how to effectively find information we need and determine if reading a certain article is worth our time.

That just about covers everything between my last blog post and now!

~Steve

Note: The cafeteria here is an absolute 10/10. They consistently offer healthy food everyday as well as delicious, not-so-healthy food. There is always an employee manning the sub station similar to Subway, and the cafeteria even provides high quality food made fresh per request! To give you an idea of that, I had salmon today and steak yesterday.

Blog Post #5: First EEG Test! – 9 JUN 16

Posted on [June 9, 2016](#) by [heinisch](#) June 23, 2016

After much fumbling around last night trying to figure out everything I needed to have done for today (and then actually getting it done), I woke up this morning knowing that Team Wireless EEG would start our data collection today! It had already been established that I was going to be the guinea pig so I was very excited to get over to the lab!

Upon arrival, I sat in the chair designated for testing. As the subject, my job was to endure the 45 minute setup that's involved in putting the EEG cap on. There is a steep learning curve in putting the cap on, so the process took a bit longer than normal, but we will get better at it! In a nutshell, the cap has 64 holes with an electrode in each. For each hole, you must insert a plastic syringe, lightly dig the hair away from the scalp, and fill the hole with conductive gel, which helps conduct the signal. This portion is the bulk of the setup and I can see how it could be discomfoting, but I didn't mind it at all. Furthermore you must connect wires to each electrode, attaching a sensor under each eye, one behind the ear on the side of the dominant hand, and one between the eyebrows, and complete the setup by attaching sensors to the finger you will be tapping to create the data. Between setup, data collection, and breakdown we spent about 2 hours in the lab, which is 30 minutes longer than our graduate mentor says it should take.

Aside from taking the EEG today, we also had another luncheon lecture. This time it was with Dr. Jim Oliver, who took a much less structured and more casual approach. Although Team EEG was late coming from the lab, we were able get there in time enough to listen to Dr. Oliver talk all about the different tiers of entry for graduate school, the benefits for each tier, and methods of attending graduate school while saving and even making money. Although I knew a bit about funding graduate school, Dr. Oliver's lecture certainly dove deep into the details of it and gave me a much better idea of how to go about applying for graduate schools.

Although this blog is being posted after the Craft of Research, it was supposed be posted before, so I will talk about it in my next blog post.

~Steve

Blog Post #4: PayDay – 8 JUN 16

Posted on [June 8, 2016](#) by [heinisch](#) June 23, 2016

The time allocated for blogging yesterday was the last scheduled event that my team had until 6pm, as we had our team meeting from 9am-11am as opposed to 2pm-4pm. Even though I had finished my blog at 1:30pm and had nothing else scheduled until 6pm, we were still expected to stay in the lab and be productive until 5pm. Looking at the calendar prior to starting the day, I was excited to see that we were going to have a shorter day than normal, only to be reminded later that we must still fill our unstructured time. With that established, I'm sure we will, unfortunately, have to come in by 9am tomorrow despite not having anything scheduled until 11am.

I was able to make great use of the extra time yesterday by completing the training checklist given to us by Dr. S. After that, we had an hour between 5pm and 6pm to do what we wanted, so I decided to go for a walk, cash my check, and pick up some groceries. We then began the process of designing our summer shirts, which took longer than I expected due to differing opinions of how to approach it. Finally, Erik took control and we were able to pick colors and the design. While not everyone agreed with the method of voting we used, if it weren't for somebody taking control we would have been in there forever.

To close out yesterday, we all walked to the center of campus to take our group photo, followed by Stanley and I working out at the gym until 10.

Today we had another lecture in C++ in which we went over loops and branches. I was also able to read some of

the articles that we are discussing tomorrow during the unstructured time. I will express my opinions on these articles at the meeting tomorrow.

~Steve

Blog Post #3 – 7 JUN 2016

Posted on [June 7, 2016](#) by [heinisch](#) June 23, 2016

Being a Monday, the night following my most recent blog post consisted mostly of napping and filling out miscellaneous paperwork. Considering that we've had longer days and extracurricular events nearly everyday, it was actually a nice change to simply lounge around. Taking advantage of this was necessary, as our normal schedule would promptly resume on this early Tuesday morning, a special morning in which our Wireless EEG team would have to get up even earlier than normal to finally, finally get a tour of our lab. We explored the room in which we will be participating as subjects in the collection of data and assure that the Wireless EEG is working properly, as well as the lab where we will (hopefully) test the practicality of performing these EEG's while moving. Unfortunately Dr. S was not around, but I'm hoping that we can begin to actually take the EEG's on Thursday when we meet again.

Next on the schedule for today was our first Luncheon Lecture with Dr. Winer. This was a bit more casual and interactive than I was expecting, but it was an excellent opportunity to have genuine conversation with Dr. Winer and delve into him on a personal level. He explained more about what motivates him and what he does outside of research, and expressed an authentic interest in our personal and professional goals.

Next semester I will be going to University of Wisconsin – Madison to finish the final two years of my undergraduate career and have thus far considered that to be my top choice for graduate school, but Dr. Winer and this experience as a whole thus far have convinced me to at least apply to Iowa State for graduate school. We'll see what happens next.

~Steve

Blog Post #2 – 6 JUN 16

Posted on [June 6, 2016](#) by [heinisch](#) June 23, 2016

Since my last blog post, I have officially experienced my first weekend in Ames! While normally we will be able to spend the weekends how we choose, this particular weekend was planned out for us. On Saturday we went to Ames' version of Summerfest, which was vastly different from what I'm used to in Milwaukee. The festival encompassed several blocks that were peppered with shops, games, and a beer garden that contained live music. Although I would have preferred to walk around with everybody else, I felt obliged to spend some time in the beer garden as it was my 21st birthday.

On Sunday we were invited to a Welcome Picnic along with all of the other REU interns at Iowa State. It was not until I arrived that I discovered just how many REU interns there actually were. We got to mingle with interns from other programs, play games with them, and of course eat free food. Many of the other interns were extremely down-to-earth people, and invited Brian and I to Orange Leaf after the picnic! Hopefully we will get another chance to spend more time with the other interns.

Today we finally started our first course, which was a crash course in C++. Even though I have only taken three computer science courses, they were all in C++, so everything thus far has been review. The course schedule is a pair of two hour sessions on Monday, Wednesday, and Friday this week and next week, so I really hope we get into more advanced stuff for my sanity's sake.

That pretty much covers everything that has happened between my last blog post and now.

~Steve

First Blog Post! 3 JUN 16

Posted on [June 3, 2016](#) by [heinisch](#) June 17, 2016

After being here for three days, we finally have gotten our blogs set up! The first few days mainly consisted of basic tours, orientation, team building, and paperwork, but as the days progress our activities are becoming more and more related to what exactly we'll be doing here.

Yesterday, we finally met with our project leader, who detailed how our Wireless EEG project will progress throughout the summer. Although this project was my second choice, I had been considering making it my first, and after listening to her presentation I become thoroughly satisfied and excited for the upcoming weeks.

Today we did a bit more tedious testing and paperwork, but we also went on an extremely stimulating tour of the VRAC where we got to demo the C6, learn about 3D-printing, and experience an immersive, virtual reality drawing system. While the C6 was definitely the most impressive (and expensive), my favorite was the drawing system, as it provided the most immersive experience and extraordinary depth. One could draw a shape in the air and move around it to observe and add to it.

Looking forward, I am excited to take the courses and get started on our project, and also am ready for all of the extracurricular activities that are planned for us. Tomorrow is my 21st birthday, so I'm hoping to find something fun to do then.

That seems to cover what has stood out to me thus far. I will make another blog post in the near future!

~Steve