A journal of your project work with weekly entries in which you describe: your results, your findings, your algorithms, your frustrations, etc.

Week 1: May 26th – June 1st

When I first arrived to the lab, I was set up with a desk and given instructions on how to obtain the permissions needed to utilize a University of Florida account. I was sat down with my mentor, Keith McNamara, and offered a list of projects to work on. A few of the more developed projects seemed far out of my interest, so I decided to go with an exploratory project centered around Brain-Computer Interaction. Because this concept was completely new to me, I spent the majority of the week reading background research about it. I also spent the week looking for papers relating to what our objective was: to visualize brainwaves in a way that was aesthetically pleasing. By the end of the week, I had a fairly good idea of what BCIs were and what they could be used for as well as the possible challenges we could face while working with them. I set up a meeting with a professor at the institution, Dr. Kyla McMullen, who had done a lot of work with the technology to obtain some help with crafting our methodology.

Week 2: June 2nd – June 8th

During the lab meeting of the second week, it was decided that my project lacked elements needed for a successful REU. It was suggested that I aim for a project with a different end-goal. Therefore, I decided to delve into Deepfake research, as it is an emerging field and could have a large societal impact. Once again, I set my sights o background research to get a better understanding of the origins of Deepfake technology and what it is used for currently. It was odd to find most of my information in magazines rather than papers, so it was difficult to know which sources were legitimate and which were not (which is ironic). The main concerns I had after my background research was that there did not seem to be much analysis of the human perspective towards Deepfakes, though that was the perspective being used to create algorithms to detect said Deepfakes. In addition, here was a lot of conjecture on the internet about the effects of Deepfakes at large. It seemed moderately fanciful to me, particularly because fake videos have been circulating for years now.

Week 3: June 9th – June 15th

Another graduate student, Imani Sherman, worked with me to create my own fake media material. I made five altered still pictures as a preliminary measure. When looking for ways to create a real deepfake, I ran into concerns with the sites I would have to go through to download the software needed. Rather than creating my own Deepfakes, it was decided that I would use some found on the internet. By the end of the week, it was decided that the focus of the project would be on altered videos specifically. I went through Reddit and Youtube to locate 8 altered videos to use for a user study.

At the same time, I was given a second project to contribute to. A project occurring in the lab, headed by Rua Williams, was delving into the use of AR/VR in physical therapy. They gave me a collection of data from their last experiment to run tests on. I decided to begin by refreshing my Statistics knowledge and taking advantage of the resources around me. Dr. McMullen allowed

me to borrow a great Statistics textbook and Imani Sherman sent me multiple eBooks regarding statistical analysis.

Week 4: June 16th – June 22nd

During this week, the first draft of my survey was created. To create the survey, my mentor and I brainstormed what type of information we would like to obtain from the test taker. This brainstorming was much more difficult than anticipated because there was a long list of information we could have gotten from the user. However, it was imperative that we became as specific as possible to optimize the review of the results. To do so, we needed to nail down what the purpose of the study was supposed to be. We ended up having quite a few questions: "Do people mistake Deepfakes with real videos?", "What helps the individual determine real from fake?", and "Who do individuals trust to give them real information?". With all of these questions, we needed to identify our limitations in terms of a user study survey rather than an interview. It was more feasible for us to obtain data for the first question consistently with no real guarantee for the other two. Therefore, we added space for a free response to answer the second and third question rather than adding too much work for the taker.

Week 5: June 23rd – June 29th

The initial draft showed the video and then asked, "Would you believe this video was real if it were shown to you by your preferred news network?". However, it was brought to my attention that individuals cannot make connects in that manner. Once the video is shown, a decision is made on the validity of the video. A person cannot accurately place themselves in a new bubble post-decision and accurately retell their point of view. Therefore, I revised the survey to set up an environment prior to showing the video so individuals could place themselves in the proper headspace prior to watching any video. It was also decided, due to the nature of the research and how many individuals would be needed for it to be meaningful, more material needed to be utilized to obtain a valid result.

Week 6: June 30th – July 6th

During this week, I was able to complete the data analysis for the AR/VR and physical therapy study. When given the raw data, I first set out to organize the hundreds of points of data. I did this by separating data by participant, exercise type, and control type (whether the participant's experience was gamified or not). After properly organizing the data, I was able to normalize it. After normalizing all of the data, I was able to apply multiple t tests to the data. After applying the t-tests, it was clear that there was a level of improvement throughout all participants. In addition, we were able to see that the participants who had a gamified version of the software did perform better than those without the gamified version. Because this was a pilot test, it made us capable of deciding that more work should be done to determine a valid result.

Week 7: July 7th – July 13th

During this week, the final draft of the survey was finalized after a two-hour meeting with the lab PI and two graduate students who oversaw my project. After we cemented the purpose of the study, we clarified the questions used to acquire the desired data. Adding in the new material was a long and tedious task. It was difficult to collect all the necessary videos because

there were 32 needed. In addition, much attention needed to be focused on the way that the questions were phrased. With user surveys, it is easy to incorporate bias into the questions asked within the survey. I worked hard with the two graduate students to try to perfect the questions and material. At the same time, we noticed we had too many questions we wanted answered within one survey. Rather than focusing too hard on answering all the questions and adding too much work for the survey taker, we decided to answer at least one question (can the user tell the difference between real and fake) and leave the rest of the questions to be answered through free response if possible. Hopefully takers will fill out the free response and we will acquire good accounts of what people focus on when watching videos and who they trust to communicate the authenticity of material.

Week 8: July 14th – July 20th

Before submitting the IRB, a pilot study was down within the lab to get a better idea of how people would read and feel about the survey. This was interesting because most of the individuals in the lab had not experienced the survey and only had a vague, if any, idea of what type of study I was conducting. We determined that this study would be really interesting in terms of bringing out factors that would need to be considered during the next political election. Because the survey takes into consideration what platforms individuals trust to acquire media authenticity confirmations, it was predicted that news sites would add a specific tool specifically for checking media authenticity. I noticed that with photos of people created by machine learning, articles were released to point out the "tells" that show if the person in the picture is real or fake. I believe a similar thing will occur with videos because no matter how well machine learning works, a computer can never fully be a human. When we determine the giveaways for falsified videos, it will allow more individuals to detect the authenticity or lack thereof. The pilot allowed me to see flaws in the wording of questions within the survey and I was able to edit the questions for clarity before moving on and submitting the study as a whole to the IRB.

Week 9: July 21st – July 27th

During this week, the IRB was submitted. It did take longer than anticipated to create and submit the IRB for various reasons, including an incomplete understanding of the project on the part of the graduate student submitting the documents. After the IRB was submitted, presentations were created to recap the summer and I was able to present a couple times before the summer was over.

Week 10: July 28th – August 3rd

The IRB came back and said we could not use our own personal social media to send out the survey and directed us towards specific organizations to help us get the word out. There was a lot of confusion around this method because the guidelines for social media usage were not easy to find or very straightforward. There were concerns about the probability of having to pay for the survey to go out and there were concerns surrounding when it would go out. Therefore, we had to set up a few meetings with those in charge of the social media guidelines to clarify where to find the guidelines, how to abide by them, and what resources were available for us to use for disseminating our survey. After multiple meetings, the idea of dissemination was more clear but there were still concerns about how attractive the flyer and blurb were.