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**Summary of work done in Neural Systems Lab**

In my first quarter at Neural Systems Lab, I shadowed grad student Nile Wilson and helped her in data collection. The research was focused on learning about the co-adaptability model in learning how to use an EEG based BCI. We used Neuro Electrics Enobio to collect data while participants were required to do set tasks. There were 3 tasks, initially they had to move a pointer to the target using keys (Left or Right) for 10 minutes. In second task, they had to imagine moving their left or right arm for 10 minutes depending on the instruction given on the screen. In the last task, participants had to move the pointer to the target but just by imagining instead. The participant group was divided into 2 parts, in first we used machine learning after task-3 and in second we didnt. By doing this we wanted to see which group performed better, and if using machine learning is better or just letting the participant adapt to using the newly acquired skill is better.

I had to go through CITI Human Research training before I could work with Human subjects. In that training I learnt about consent and how to debrief the participant about what the research is about and if there are any risks involved and any other information they need to know. I also got to setup the research interface on my laptop, which included all the software and the code required. I learnt to use the Enobio headset and how to maintain the equipment and clean and the electrodes after the data collection is done. It is important to fix the cap in the right place and the position of the first electrode is determined by ensuring distance between forehead and the first electrode.

To contribute to the lab, I suggested some improvements like using an eye tracker to see when the participant blinks and then later we can filter the data out because eye blinks give noisy data but because we didn’t have enough data therefore, we couldn’t do it. Nile also told me that another alternative could be to use EMG or EOG to collect eye blinking data instead of an eye tracker. We could also use Night Light mode on the computer to prevent eye dryness as the participants were asked to minimize blinking. Overall, I familiarized myself with the lab environment and look forward to start contributing in there.