**Project report & Status update**

**Gist:** The objective of the project is to classify the eeg signals correctly using machine/deep learning and simulate a robotic arm

**Objectives achieved:**

**Data**

1. Extracted a four class eeg signal from BCI competition IV. The signal is not related to the application as my application demands shoulder, elbow, wrist, gripper. The data is for left hand, right hand, leg and tongue movements. So, I assumed tongue to be the gripper, leg to be the base, left arm as shoulder and right arm as elbow. So the JACO robot becomes a 4axis robot in the simulation software
2. The data was multiple .gdf files so extracted it in Matlab and then imported it in python.
3. Implemented ICA to find if there is any underlying signal and subtracted the output from the original signal.
4. As the dataset consists of only classes, I randomly generated an array of theta and velocity and appended in my training dataset, so the model now classifies

**SVM (machine learning)**

1. Went ahead with SVM as my machine learning algorithm. I am still on validation stage, so once I am done with validating the parameters, I will send you the final parameters.

**VREP simulation:**

1. Vrep gives me an opportunity to use it API in python. Once I start the simulation, I have to pass my test dataset, the trained model will give the result which consists of the class (joint) to be actuated, velocity and theta.

**To-Do:**

1. Develop SVM model to predict theta and velocity.
2. Validate the SVM model for different parameters.
3. Implement PCA to figure out if it reduces the computation time by removing unwanted features.
4. Analysis and video recording of the simulation.