Bonus Report (Updated)

Group 1

Please submit a report by group answering the following:
- Method: Your strategies implementing the BCI car, including EEG/other signal feature, preprocessing, classifier, control method etc.
- Discussion 1: The challenges and difficulties you encountered during the process and how you solve them.
- Discussion 2: Other things you wish to discuss, such as contribution.

Only one team member per group will have to submit the report to the 'Lab3: Car Competition' assignment on E3. Please submit a zip file containing (1) the report pdf file and (2) the code for the BCI car. Please name your zip file as lab3_GroupX.zip

Method:

Control signal : EEG(alpha waves)

Control Method: We've divided the time quantum into four sessions - front, left, right, and wait, and repeat it as a cycle. In each time session, we've divided it into two parts - rest and conduct. During the rest part, we collect alpha signals for a specific period. Once we detect a signal that surpasses the threshold, in the conduct part, it will execute instructions for the car. The instructions correspond to the time quantum to which they belong.

Discussion 1:

At the beginning of the class, we encountered difficulties in implementing the code we had previously worked on. We eventually discovered that the pipeline graph (pretrained model) provided by OpenVibe uses specific channels, preventing us from specifying our preferred channels. Consequently, we developed another version of the code to complete this lab. In this version, we utilized alpha waves as our signal to control the car, drawing inspiration from lab2. Speaking of the flawlessness of this code, controlling alpha waves with mindset proves to be challenging. Additionally, participants must show a high level of patience throughout the entire experiment.

Discussion 2:

After the entire session of this lab, we have concluded that instead of using the raw EEG signal as our control signal for the car, incorporating the pretraining session into the EEG signal may enhance the performance to some extent. Moreover, in terms of real-time performance, I believe SSVEP can outperform other methods. In summary, this lab is challenging and has also excited us throughout the entire process.