Data Preprocessing:

According to the principle of event related desynchronization (ERD) and event related synchronization (ERS), when people perform MI (Motor Imagery) tasks, the cerebral cortex will produce obvious rhythm signals, which are divided into 8–12 Hz μ rhythm signals and 13–30 Hz β rhythm signals. In order to improve the signal-to-noise ratio of EEG signals, 8–30 Hz band-pass filtering is used to process the data and remove the baseline. At the same time, the corresponding EEG signal was extracted as the subsequent analysis data by using the time window of 0.5–3.5 s after the appearance of the prompt. (based on this article)

It is noted in the literature that while performing any motor imagery tasks, two major frequency band of EEG spectrum i.e mu (7-12 Hz) as well as beta (12-30 Hz) bands are actively involved. Hence, in most of the literature work EEG signals were filtered using a frequency band of 7-30 Hz usually before using CSP transformation. (based on this article)

Channel Selection:

Regarding this article, EEG electrode positions are as follows: Fz, FC3, FC1, FCz, FC2, FC4, C5, C3, C1, Cz, C2, C4, C6, CP3, CP1, CPz, CP2, CP4, P1, Pz, P2, and POz, left mastoid reference, right mastoid grounding.

Transfer Learning:

In this paper, the results show that the best framework is the combination of the EEGNet and ‘fine-tune’ transferred model. EEGNet model has great potential for MI stroke rehabilitation based on BCI system. It also successfully demonstrated the efficiency of transfer learning for improving the performance of EEG-based stroke rehabilitation for the BCI system.
Three processing methods have been performed on the EEGNet model.