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Personalized Classifier Selection in EEG-based Brain-Computer Interfaces

Cerebral palsy, affecting nearly 1 in 500 children globally, is a dominant cause of severe movement disabilities in children. Electroencephalogram (EEG) signals have successfully been utilized to provide alternative communication pathways through brain-computer interface (BCI) systems to help those children communicate their needs. The crucial component of a BCI is a classifier, which works in real-time to translate EEG signals into meaningful words or wheelchair commands, and its accuracy and speed are critical to the utility of BCI devices. However, there is significant inter-subject variability in the data; moreover, this variability affects classification accuracy and the choice of the best classifier for different individuals over time. This calls for a personalized medicine approach, with classifier selection automatically tailored to individuals and their current needs.