Machine-based learning system: Classification of ADHD and non-ADHD participants

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Abstract:

Attention-deficit/hyperactivity disorder (ADHD) is the most frequent diagnosis among children who are referred to psychiatry departments. Although ADHD was discovered at the beginning of the 20th century, its diagnosis is confronted with many problems. In this paper, a novel classification approach that discriminates ADHD and non-ADHD groups over the time-frequency domain features of ERP recordings are presented. Support Vector Machine-Recursive Feature Elimination (SVM-RFE) was used to obtain best discriminating features. When only three of these features were used the accuracy of classification reached to 98%, and use of six features further improved classification accuracy to 99.5%. The proposed scheme was tested with a new experimental setup and 100% accuracy is obtained. The results were obtained using RCV. The classification performance of this study suggests that TFHA can be employed as a core component of the diagnostic and prognostic procedures of various psychiatric illnesses.