

Abstract

Accurately detecting late-onset or mild Attention-Deficit/Hyperactivity Disorder (ADHD) remains one of the major challenges in behavioral health. Traditional screening methods, such as self-reported questionnaires, are affected by biases and can't directly assess patient behavior. Recent research shows that machine learning (ML) can enhance digital ADHD testing by analyzing mouse movements to identify behaviors consistent with ADHD.

Studies have demonstrated noticeable differences in mouse movement patterns between individuals with ADHD and neurotypical participants. Mouse tracking data collected during digitized versions of the Stop Signal Test can be analyzed using ML models. Features like higher mouse velocity and acceleration are correlated to Hyperactive/Impulsive subtype of ADHD.^[1]

Another key characteristic linked to childhood ADHD is weak fine motor control.^[2] In a recent study, traditional motor skills assessments were adapted as computer games which collected mouse movements. Logistic regression models trained on this data achieved 78% accuracy in predicting ADHD.^[3]

Furthermore, drag-and-drop puzzle tasks have revealed significant differences in behavioral patterns. Individuals with ADHD had varied mouse trajectories compared to neurotypical participants with more linear mouse movements.^[4] They also needed more time to complete the puzzles. These differences became more pronounced as task difficulty increased.

Overall, machine learning has the potential to provide valuable insights that aid diagnosis. If developed, these models can be incorporated on school or library computers drastically improving early detection of ADHD.

Citations

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4. S. Sadhu, E. Castillo, L. Weyandt, D. Solanki and K. Mankodiya, "Feasibility of a Digital Health Puzzle Game for Detecting Computer Mouse Behavioral Patterns in ADHD," 2024 IEEE 20th International Conference on Body Sensor Networks (BSN), Chicago, IL, USA, 2024, pp. 1-4, doi: 10.1109/BSN63547.2024.10780663.