**TITLE: ENHANCING EARLY AUTISM DIAGNOSIS THROUGH MACHINE LEARNING**

**DOMAIN:** Artificial Intelligence in Healthcare

**SUB-DOMAIN:** Early Detection of Autism Using ML

**ABSTRACT:**

Traditional diagnostic methods for ASD are often subjective, reliant on lengthy observational assessments, and require specialized expertise, which can delay treatment and increase caregiver anxiety. By harnessing behavioral and developmental data, this research aims to build predictive models that identify early signs of autism with higher accuracy and efficiency than conventional methods. Machine learning algorithms, trained on diverse datasets containing behavioral patterns and developmental indicators, can assist in the early detection of ASD by providing clinicians with a data-driven approach to screening. The study will evaluate model performance in terms of diagnostic accuracy, sensitivity, and specificity, as well as the models' adaptability to various demographic groups. The successful integration of these predictive models into pediatric autism screening protocols could not only enhance diagnostic accuracy but also significantly reduce the time and resources required for assessment. Ultimately, this approach holds the potential to support clinicians in offering personalized treatment plans, enabling earlier and more effective interventions that could improve long-term developmental outcomes for children with ASD.

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