

Abstract

Autism Spectrum Disorder (ASD) is a complex neurodevelopmental disorder characterized by a wide range of social, communication, and behavioral challenges. Over the years, there has been a growing interest in utilizing machine learning and deep learning techniques to aid in early diagnosis, personalized treatment, and understanding the underlying mechanisms of autism. This project presents a comprehensive review of recent advancements in the application of machine learning and deep learning approaches to autism research. Various data sources, including behavioral observations, neuroimaging, genetic data, and electronic health records, have been leveraged to develop predictive models, identify biomarkers, and uncover hidden patterns in ASD. Additionally, the project discusses the challenges and limitations of these methods, such as data heterogeneity, small sample sizes, and interpretability issues. Through this synthesis of research, the project highlights the potential of machine learning and deep learning in enhancing our understanding of autism and facilitating more targeted interventions for individuals on the spectrum.

Key Words: Autism Spectrum Disorder machine learning individualized therapy underlying causes