Autism Spectrum Disorder Detection

Prof. Ayesha Khan, Mr. Aishwary Mahore, Ms. Aishwarya Boharupi, Ms. Akanksha Lohakare, Mr. Alpesh Muneshwar, Mr. Amey Dhote, Ms. Harshita Tripathi

Department of Artificial Intelligence Engineering

G. H Raisoni Institute of Engineering and Technology, Nagpur, India

Abstract*: Autism spectrum disorder (ASD) is a complex neuro developmental condition affecting social interaction and communication skills. Current diagnostic methods often rely on structural and resting-state functional magnetic resonance imaging (fMRI) with limited datasets, leading to high accuracy but limited generalizability. To address this, machine learning, pattern recognition, and other techniques have been used, achieving high accuracy but moderate generalization. This study introduces a novel approach to ASD detection using deep learning (DL), specifically a Convolutional Neural Network (CNN) classifier. By leveraging anatomical and functional connectivity indicators from fMRI data, our model aims to enhance the automated diagnosis of ASD. The proposed approach demonstrates significant improvement over existing methods, achieving an accuracy of approximately 85% in classifying autistic patients. Through the utilization of a ResNet model, this work showcases the potential of DL in advancing the accuracy and reliability of ASD diagnosis.*

Keywords: autism spectrum disorder; neurodegenerative illness; social abilities; fMRI; deep learning; convolutional neural network; anatomical connectivity; functional connectivity; automated diagnosis; ResNet model