



Autism Detection Using RESNET50 & XCEPTION Transfer Learning

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Abstract

The Autism spectrum disorder (ASD) is the neuro development disorder. It effects on how the people communicate and interact with others. In this we particularly concerning three domains social functioning, communication and Stereotyped Behaviors. Diagnosis of autism requires significant amount of time and cost. ASD can be cause due to having an immediate family member who's autistics, certain genetic mutations and some mental and physical health condition. Early detection of autism can come to a great help by prescribing patients with proper medication at an early stage. According to the ASD problem starts with childhood and continues to and keep going on into adolescence and adulthood. Based on some machine learning algorithms like Naive bayes, support vector machine, logistic regression, KNN, CNN (Convolution neural networking) for predicting and analysis of ASD problems in child, adolescents and Adults. So, this will try to shed light on characteristics and features of Autistic children and their common language, speech and communication related problems so that it may help to the diagnosis as soon as possible to take effective measures.

Keywords: *Naive bayes, support vector machine, logistic regression, KNN, CNN*

1. INTRODUCTION

Autism spectrum disorder (ASD) is a complex neurodevelopmental disorder generally it can be cause due to having an immediate family member who's autistics, certain genetic mutations and some mental and physical health condition is characterized by deficits in communication and social interaction and restricted, repetitive patterns of behaviors, interests, and activities. The problem of autism spectrum disorder now a days it is mounting swiftly to all ages of Human population. Autism patients face different types of challenges such as

difficulties with concentration, learning disabilities, mental health problems. Current explosion rate of autism around world is numerous and it is increasing at the very high rate. Earlier detection of autism can be great help for patients at an early stage. The doctors will diagnose a child with ASD specific methods for diagnosis of children with Autism are broken down in to two levels: level-1 Initial screening level and it is carried out by general practitioners of children. Level-2: Get the more detailed evaluation from experts and again early detection ASD around 18 months but diagnosis is usually at or after age of three and assignments are conducted using



neurodevelopment frame work the frame work includes involving the child's family and doctors .ASD difficult to diagnose because it has such diverse list of symptoms which include delayed in speech, no proper eye contact , lack of response ,poor social skills, Atypical tone behaviors issues, learning delay and more the main causes of ASD. Autism spectrum disorders (ASDs) describe a group of neurodevelopmental conditions in which the individuals face challenges with social engagement and ageappropriate play and fail to develop appropriate peer relationships according to their developmental level. Although young people are frequently recommended to participate in leisure activities including play, sports, hobbies, and social activities, children with ASD tend to spend time in passive play and maladaptive behaviors and they are less likely to spontaneously participate in organized leisure activities such as sports. It could be attributed to their significant deficits in development of motor development and physical activity (PA) behavior. Social and behavioral impairments in ASD can limit children opportunity to participate in physical activity and recreation programs that eventually end to their inactivity. Physical inactivity predisposes children with ASD to several comorbid conditions such as overweight and obesity. To assess key correlates of physical activity, previous studies frequently addressed social

variables as critical factors contribute to ASD children physical activity. For example, Pan showed that children with ASD who had lower social engagement with adults displayed lower levels of physical activity than children had higher social involvement. Indeed although children with ASD receive rehabilitation services from an early age in order to improve daily performance and enhancement of active life, PA and leisure aspects of quality of life (QOL, parents and caregivers have to spend many resources while making a balance between children needs and those of family or guardians is a difficult task. Thus recently, studies examining QOL in a wide range of individuals with ASD indicated that adults with ASD have lower scores in wellbeing measures, and children also show a sub ideal outcome. A recent study on ASD demonstrated a positive connection between cheerfulness and participation in a quality leisure program; authors also indicated that satisfaction is also correlated with leisure activities in individuals with ASD.

Different existing data mining procedures and its application were considered or explored. Utilization of machine learning algorithms was connected in various medical data sets. Machine learning strategies have diverse power in different medical data sets. Previously mentioned conventional machine learning techniques gave less exact outcome and results additionally shifts in light of the procedures has been utilized for the prediction. Initially this project has been developed by some research persons they



developed machine learning models only. They developed ml models like random forest algorithm and SVR. Those models have the less accuracy.

2. LITERATURE SURVEY

F Bonnet-Brilhault et al., [1]The ASD are complex neurobehavioral disorder by by social and communication deficits and repetitive and stereotyped behaviors. It is now believed that environmental factors may modulate phenotypical expression of ASD that are associated with the genetic predisposition. The diagnosis of ASD can be reliably made in the second year of Life and appears to be relatively stable over time. However, diagnosis of very young children can be quite complex due to their clinical heterogeneity and varying patterns of onset that can differ from the typical autism symptoms of an older child.

Ditza Antebi Zachor et al., [2]This study evaluated the effectiveness of the ESDM for preschool-aged children with ASD using a predominantly group-based intervention in a community child care setting.in this they follow some methods there are taken some participants with some 26 children's with ASD with mean age 49.6 months. Children received 15-20 hours of group-based, and one hour of one-toone, ESDM intervention per week his study suggests community dissemination of the

ESDM using predominantly groupbased intervention may be an effective intervention.

Valsamma Eapen et al ., [3]The Behavioral interventions for children with autism spectrum disorders,the intervention behavioral is only treatment for young children with ASD s. This article describes the core features of behavioral treatments, summarizes the evidence base for effectiveness, and provides recommendations.

Patricia Manning-Courtney,Donna Murray, Kristen Currans et al., [4]Children on the Autism Spectrum and the Use of Virtual Reality for Supporting Social Skills Autism spectrum disorders (ASDs) are characterized by differences in socio-pragmatic communication. These conditions are allocated within a "spectrum" of phenotypic variability with some methods for improving social skills like emotional training and traditional emotional training.

Alessandro Frolli , Giulia Savarese et al.,[5]The Using participant data to extend the evidence base for intensive behavioral intervention for children with autism the gathered individual participants data from 16 group studies with children with autism, most children who are underwent behavioral intervention achieved change in IQ(29.8 percent)compared with 2.6percent and 8.7percent.

3. METHODOLOGY

Our proposed strategy focuses on a novel machine learning procedures for autism spectrum disorder (ASD) classification and prediction, thus

overcoming the existing problem. By utilizing Random Forest (RF), Support Vector Machine (SVM), AdaBooster algorithms and some other algorithms. We have collected the datasets from the Kaggle website and we pre-processed it. In our existing model they have tried with Random Forest Algorithm, but it is having less accuracy. So here tired with same also tried with some accuracy increasing methods to increase the accuracy of existing method. The used methods are Grid Search CV and pipeline methods. These helps a lot to increase the accuracy from 65% to 98%. Later we generate the pickle file and use that pickle file to develop the web application which makes our application to available 24/7. we will make our model in order to increase the performance and accuracy.

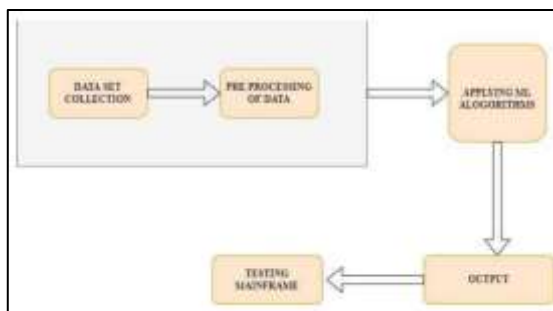


Fig.1. Data flow diagram.

4. RESULTS AND DISCUSSION

Modules are a collection of source files and build settings that let you divide your project into discrete units of functionality. Your project can have one or many modules, and one module can use another module as a

dependency. You can independently build, test, and debug each module.

- 1) **Login:** This is an online application and user need to login by using username as ‘admin’ and password as ‘admin’.
- 2) **Train Random Forest Algorithm:** We can use this model to train RF model with Autism dataset and after training model we will calculate both models’ accuracy on test data.
- 3) **Upload User Data:** using this module we will allow user to upload user data and the application will predict condition of person as healthy or effected with Autism disease.

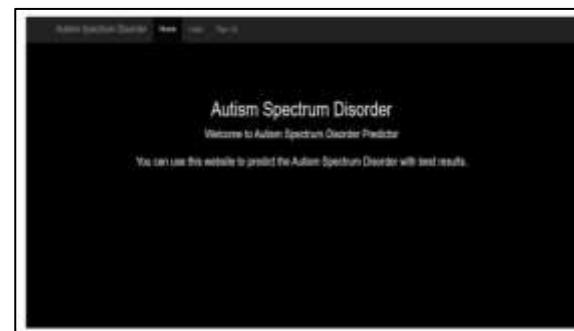


Fig.2. Home page.



Fig.3. Signup page.



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