Application of Soft Computing Technique for Surmising of Adolescence Autism

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Abstract: Neural networks also contribute to other areas of research such as neurology and psychology. Neural networks have a huge application like computing, AI, fuzzy logic. The goal of the neural network is to solve problems in the same way that a human would, although several neural network categories are more abstract. New brain research often stimulates new patterns in neural networks. An Artificial intelligence technique is a problem solving method, by simulating human intelligence where reasoning is done from previous problems and their solutions. An Artificial Neural Network (ANN) is an information processing paradigm that is inspired by the way biological nervous systems, such as the brain, process information. Now a day's, childhood autism is a common neuron-psychological developmental problem among children Soft computing consists of artificial intelligence based models that can deal with uncertainty, partial truth, imprecision and approximation. Autism is one of the most common neurological disorders found in children, resulting disabilities, which continue until adulthood. Autism spectrum disorders (ASD) are enclosure of several complex neuron developmental disorders characterized by impairments in communication skills and social skills with repetitive behaviors.

For the correct grading of Autism spectrum disorders needed a accurate intervention. The soft computing technique gives result to find the accuracy in childhood autism grading by dealing with the uncertainty and imprecision.

Keywords: ANN, ASD, Neurodevelopment, Autism

I.   INTRODUCTION

Autism spectrum disorder (ASD) is the name for a group of developmental disorders. ASD includes a wide range, "a spectrum," of symptoms, skills, and levels of disability. Autism is a neuro developmental disorder. Autism spectrum disorder (ASD) and autism are both general terms for a group of complex disorders of brain development. These disorders are characterized, in varying degrees, by difficulties in social interaction, verbal and nonverbal communication and repetitive behaviors. ASD can be associated with intellectual disability, difficulties in motor coordination and attention and physical health issues such as sleep and gastrointestinal disturbances. Some persons with ASD excel in visual skills, music, math and art. Autism appears to have its roots in very early brain development. However, the most obvious signs of autism and symptoms of autism tend to emerge between 2 and 3 year of age. Autism Speaks continues to fund research on effective methods for earlier diagnosis, as early intervention with proven behavioral therapies can improve outcomes. Increasing autism awareness is a key aspect of this work and one in which our families and volunteers play an invaluable role.

MCHAT is the Modified Checklist for Autism in Toddlers. It is a screening tool for diagnosing autism in age between 16 to 30 months. In case of timely diagnosis of autism, the early intervention program can be started. Data mining is the process of analyzing through large amounts of data for useful information. It uses artificial intelligence techniques, neural networks, and advanced statistical tools (such as cluster analysis) to reveal trends, patterns, and relationships, which might otherwise have remained undetected. It is the step of the knowledge discovery in databases (KDD) process concerned with the algorithmic means by which patterns or structures are enumerated from the data. Predicting the outcome of a disease is one of the most interesting and challenging tasks where to develop data mining applications.

The use of computers with automated tools, large volumes of medical data are being collected and made available to the medical research groups. As a result data mining techniques has become a popular research tool for medical researchers to identify and exploit patterns and relationships among large number of variables, and made

them able to predict the outcome of a disease using the historical datasets [13].Feature selection algorithm used to find the subset of input variables by eliminating the features with less or no predicting information. It significantly

improves the accuracy of the future classifier models formed by different classification algorithms.

The autism children occurs some common conditions:

- Genetic disorder
- Intellectual disability
- Social impairment and communication difficulties
- Repetitive and characteristic behaviors
- Shows little or no eye contact
- a limited span of attention
- sensitive to noise
- Sleep problems
- no babbling or pointing by age 1
- no single words by age 16 months or two-word phrases by age 2
- no response to name
- excessive lining up of toys or objects
- no smiling or social responsiveness

What Causes Autism?

Not long ago, the answer to this question would have been "we have no idea." Research is now delivering the answers. First and foremost, we now know that there is no one cause of autism just as there is no one type of autism. Over the last five years, scientists have identified a number of rare gene changes, or mutations, associated with autism. A small number of these are sufficient to cause autism by themselves. Scientists believe that both genetics and environment likely play a role in ASD. Imaging studies of people with ASD have found differences in the development of several regions of the brain. In the presence of a genetic predisposition to autism, a number of non-genetic, or "environmental," stresses appear to further increase a child's risk. The clearest evidence of these autism risk factors involves events before and during birth. They include advanced parental age at time of conception

(both mom and dad), maternal illness during pregnancy and certain difficulties during birth, particularly those involving periods of oxygen deprivation to the baby's brain. It is important to keep in mind that these factors, by themselves, do not cause autism. Rather, in combination with genetic risk factors, they appear to modestly increase risk. A growing body of research suggests that a woman can reduce her risk of having a child with autism by taking prenatal vitamins containing folic acid and/or eating a diet rich in folic acid (at least 600 mcg a day) during the months before and after conception. Increasingly, researchers are looking at the role of the immune system in autism. Autism Speaks is working to increase awareness and investigation of these and other issues, where further research has the potential to improve the lives of those who struggle with autism.

II. RELATED WORK

JyotiSoni et.al [1] compared predictive data mining techniques such as Decision tree, Naïve Bayes, K-NN, and classification based on clustering for analyzing the heart disease dataset. The classified data is evaluated using 10 fold cross validation and the results are compared. Decision Tree outperforms and sometime Bayesian classification is having similar accuracy as of decision tree but other predictive methods like KNN, Neural Networks, Classification based on clustering are not performing well. The second conclusion is that the accuracy of the Decision Tree and Bayesian Classification further improves after applying genetic algorithm to reduce the actual data size to get the optimal subset of attribute sufficient for heart disease prediction.

Carloz Ordonez et al., [4] applied association rule mining on heart disease data. Search constraints and test data validation reduces the number of association rules with high predictive accuracy. In the survey of [5] the author proposed the minimal subset of attributes for predicting heart disease. In future this work can be expanded and enhanced for the automation of heart disease prediction. Real data should be collected from health care organizations and agencies are taken to compare the optimum accuracy with all data mining technique.

The NewLatin word autisms (English translation autism) was coined by the Swiss psychiatrist Eugen Bleuler in 1910 as he was defining symptoms of schizophrenia. He derived it from the Greek word autós (αὐτός, meaning "self"), and used it to mean morbid self-admiration,

referring to "autistic withdrawal of the patient to his fantasies, against which any influence from outside becomes an intolerable disturbance".

A few examples of autistic symptoms and treatments were described long before autism was named. The Table Talk of Martin Luther, compiled by his notetaker, Mathesius, contains the story of a 12-year-old boy who may have been severely autistic. Luther reportedly thought the boy was a soulless mass of flesh possessed by the devil, and suggested that he be suffocated, although a later critic has cast doubt on the veracity of this report. The earliest well-documented case of autism is that of Hugh Blair of Borgue, as detailed in a 1747 court case in which his brother successfully petitioned to annul Blair's marriage to gain Blair's inheritance. The Wild Boy of Avevron, a feral child caught in 1798, showed several signs of autism; the medical student Jean Itard treated him with a behavioral program designed to help him form social attachments and to induce speech via imitation.

The word autism first took its modern sense in 1938 when Hans Asperger of the Vienna University Hospital adopted Bleuler's terminology autistic psychopaths in a lecture in German about child psychology. Asperger was investigating an ASD now known as Asperger syndrome, though for various reasons it was not widely recognized as a separate diagnosis until 1981.Leo Kanner of the Johns Hopkins Hospital first used autism in its modern sense in English when he introduced the label early infantile autism in a 1943 report of 11 children with striking behavioral similarities. Almost all the characteristics described in Kanner's first paper on the subject, notably "autistic aloneness" and "insistence on sameness", are still regarded as typical of the autistic spectrum of disorders. It is not known whether Kanner derived the term independently of Asperger. Kanner's reuse of autism led to decades of confused terminology like infantile schizophrenia, and child psychiatry's focus on maternal deprivation led to misconceptions of autism as an infant's response to "refrigerator mother". Starting in the late 1960s autism was established as a separate syndrome by demonstrating that it is lifelong, distinguishing it from intellectual disability and schizophrenia and from other developmental disorders, and demonstrating the benefits of involving parents in active programs of therapy. As late as the mid-1970s there was little evidence of a genetic role in autism; now it is thought to be one of the most heritable of all psychiatric conditions. Although the rise of parent organizations and the destigmatization of childhood ASD have deeply affected how we view ASD, parents continue to feel social stigma in situations where their child's autistic behavior is perceived negatively by others and many primary care physicians and medical specialists still express some beliefs consistent with outdated autism research.

III.   PROPOSED SYSTEM ANALYSIS

Data mining is also called (KDD) knowledge discovery in databases [3], and it includes an integration of techniques from many disciplines such as statistics, neural networks, database technology, machine learning and information retrieval, etc [6]. KDD process has several steps, which are performed to extract patterns to user, such as data cleaning, data selection, data transformation, data preprocessing, data mining and pattern evaluation [4]. Data mining engine include set of essential modules, such as characterization, classification, clustering, association, regression and analysis of evolution. Pattern evaluation module that interacts with the modules of data mining to strive towards interested patterns. A priority algorithm is easy to execute and very simple, is used to mine all frequent item sets in database.
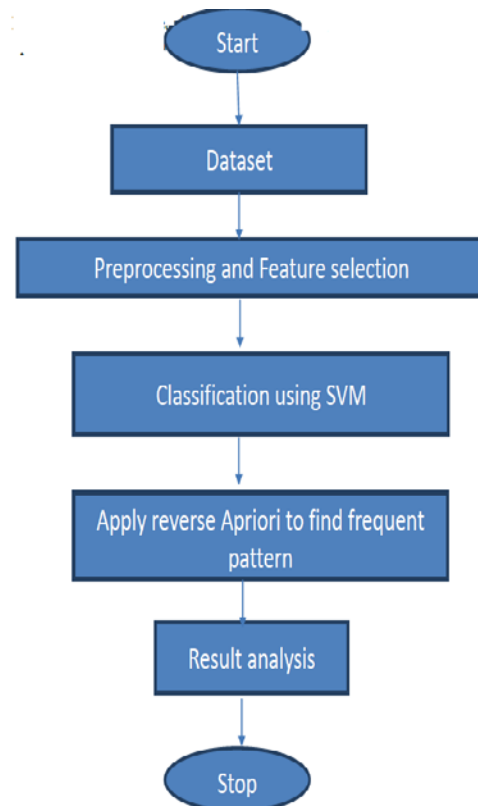

Fig 1: System Analysis for finding frequent pattern

IV. CONCLUSION

In this paper, autism affected children of age 16-30 months dataset is taken. The dataset is pre-processed and taken for feature selection. Feature Selection Algorithm such as SVM is applied. Then

different classification algorithm is applied on the subset produced by both feature selection algorithm. This paper helps in finding the best classifier for autism dataset through feature relevance analysis and classification algorithm. Among different classification algorithm applied, algorithms such as SVM for reduce the features, and also using reverse-apriority algorithm for finding frequent patter.

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