Detection of Melancholy and Anxiety in children using machine learning

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INTRODUCTION

Mental health problems, such as depression in children have far-reaching negative effects on children, family and society. These mental problems commonly include anxiety disorders and attention deficit disorder. These common mental disorders can lead to a serious and complicated issue if not treated by the professionals at the beginning stage. Machine learning techniques are used to diagnose the problem. The whole purpose of this project is to predict & analyze basic mental health problems in Children. Since the growth of people suffering from mental illness is higher than the professionals who treat them, this project is a major help for society to help in predicting the mental problems using machine learning.

LITERATURE SURVEY

Every software development requires the survey process. The survey process is needed to get the requirement for the software. The Survey also consists of studying the present system and also studying about the tools needed for the development of the software. A proper understanding of the tools is very much essential. Following is an extract of the information of the material collected during the literature survey.

Benson Mwangi et al [1]: Identifying a clinical signature of suicidal among patients with mood disorders. A growing body of evidence has put forward clinical risk factors associated with patients with mood disorders that attempt suicide. A total of 144 patients with mood disorders were included. Clinical variables associated with suicide attempts among patients with mood disorders and demographic variables were used to train a machine learning algorithm. The resulting algorithm was utilized in identifying novel or 'unseen' individual subjects as either suicide at-tempters or non-at-tempters. Three machine learning algorithms were implemented and evaluated.

All algorithms distinguished individual suicide at-tempters from non-at-tempters with prediction accuracy ranging between 65% and 72%. The most relevant predictor variables in distinguishing at-tempters from non-at-tempters included previous hospitalizations for depression, a history of psychosis, cocaine dependence and post-traumatic stress disorder (PTSD) comorbidity. Risk for suicide attempt among patients with mood disorders can be estimated at an individual subject level by incorporating both demographic and clinical variables.

S Farsi et al [2]: Diagnosis of attention deficit hyperactivity disorder using a deep belief network based on a greedy approach. Attention deficit hyperactivity disorder (ADHD) is a behavior and developmental disorder, in which children usually do not have the ability to focus on issues and their learning is slow. They have unusual activities. The disorder is associated with lack of attention disorder, hyperactivity, impulsive behavior, or a combination of them.Detection of Depression and Anxiety in children using Machine learning Many of the children have one or several other behavior disorders and may also suffer from a psychological problem such as depression or bipolar disorder mental condition) Boys are three times more than girls at risk for these complications. The disorder often begins before age seven, and parents may not realize their children's problem until they get older. Most children suffering from the disease will develop a feeling of depression, anxiety and lack of self-confidence.

Given the importance of diagnosing the disease, Deep belief networks (DBNs) were used as a deep learning model to predict the disease. The proposed method was evaluated by the standard data sets of ADHD-200 Global competitions, including Neuroimage and NYU data sets, and compared with State-of-the-art algorithms. The result showed the superiority of the proposed method rather than other systems. The prediction accuracy has improved respectively as +12.04 and +27.81 over Neuroimage and NYU datasets compared to the best proposed method in the ADHD-200 Global competition

CM Danforth et al [3]: Instagram photos reveal predictive markers of depression. Using Instagram data from 166 individuals, we applied machine learning tools to successfully identify markers of depression. Statistical features were computationally extracted from 43,950 participant Instagram photos, using color analysis, metadata components, and algorithmic face detection. In this report, we introduce a methodology for analyzing photographic data from Instagram to predictably screen for depression. Instagram members currently contribute almost 100 million new posts per day, and Instagram's rate of new users joining has recently outpaced Twitter, YouTube, LinkedIn, and even Facebook.

In our research, we incorporated an ensemble of computational methods from machine learning, image processing, and other data-scientific disciplines to extract useful psychological indicators from photographic data. Our goal was to successfully identify and predict markers of depression in Instagram user's posted photographs.

The present study employed computational machine learning techniques to screen for depression using photographs posted to Instagram. Our results support Hypothesis, that markers of depression are observable in Instagram user behavior, and Hypothesis, that these depressive signals are detectable in posts made even before the date of first diagnosis. Human ratings proved capable of distinguishing between Instagram posts made by depressed and healthy individuals, but showed little or no correlation with most computational features.

Existing system Disadvantages

Mother and father lack interest closer to their children and neglect their actions. Additionally the youngsters who don't concentrate to their dad and mom, and are in their very own obstacles and do not percentage their pain or happiness with elders. Few youngsters are more involved about academics and exams. Annoying too much may be a reason of depression.The demotivating or worrying humans around them may be a primary motive for mental distress or agitation attributable to trouble normally for some element impending or expected. Some children are born more disturbing and much less capable to deal with others. Over Controlling via parents may additionally boom tiers of social tension in kids. Separate tension is the maximum not unusual anxiety ailment in youngsters (greater or younger than 12). Attention Deficit Hyperactivity disorder (ADHD) is the maximum common adolescents disease which can keep to adulthood. Pervasive improvement sickness (PDD) refers back to the delays within the development of many simple capabilities. Few tension problems can motive fast heart price, Palpitations (abnormal coronary coronary heart-beat) and Chest pain. Nowadays social media is likewise a platform in which all feelings are dumped. Remarks and compliments make some of difference in a unmarried lifestyles. Those problems should most effective be identified with the useful resource of psychological terms or via more interactions.

Proposed system & advantages

An interview turned into held with a brand new psychologist to pick out the mental fitness issues that arise more often amongst youngsters. Then a model become constructed that makes use of system getting to know strategies to stumble on five not unusual intellectual fitness issues. However the utility best identifies defects in youngsters via particular age handiest, with the help of an set of rules. This problems Identifies trends and patterns and no human intervention is needed, that is subject rely professional isn't always required. There may be continuous upgrades in which depression and tension levels are expected. Extra users can be dealt with at the identical time. Every body can have enough money, as it's no longer costly in remedies. The software program applications will now not hold and open speedy and with ninety nine percentage uptime. The system identifies invalid input and produces suitable mistakes messages. The destiny benefits of system getting to know is that it eliminates many habitual duties and helps corporations to awareness on greater specialized responsibilities. It enables agencies to automate manual paintings. Foremost gain of system studying in detection is fast processing and huge databases. This method gives the possibility to enhance anomaly(something bizarre or odd) detection through a better detection of patterns, and to improve the classification of events by severity and purpose

System design

The System should be designed in a secured way by applying safety measures information. Transmission should be securely transmitted to nodes without any changes in information. Special exception handling mechanism should be in place to avoid system errors. System definition section defines the working procedure of the data model of depression and anxiety using machine learning application.

Three-tier Architecture is a client-server architecture in which the user interface, business process & data storage and access are developed and maintained as independent modules. **F**lexibility, **Re-usability** and **S**ecurity are the main reasons for considering this application. The **three logical tiers** are **Presentation tier**, **Middle tier** and **Data tier**.
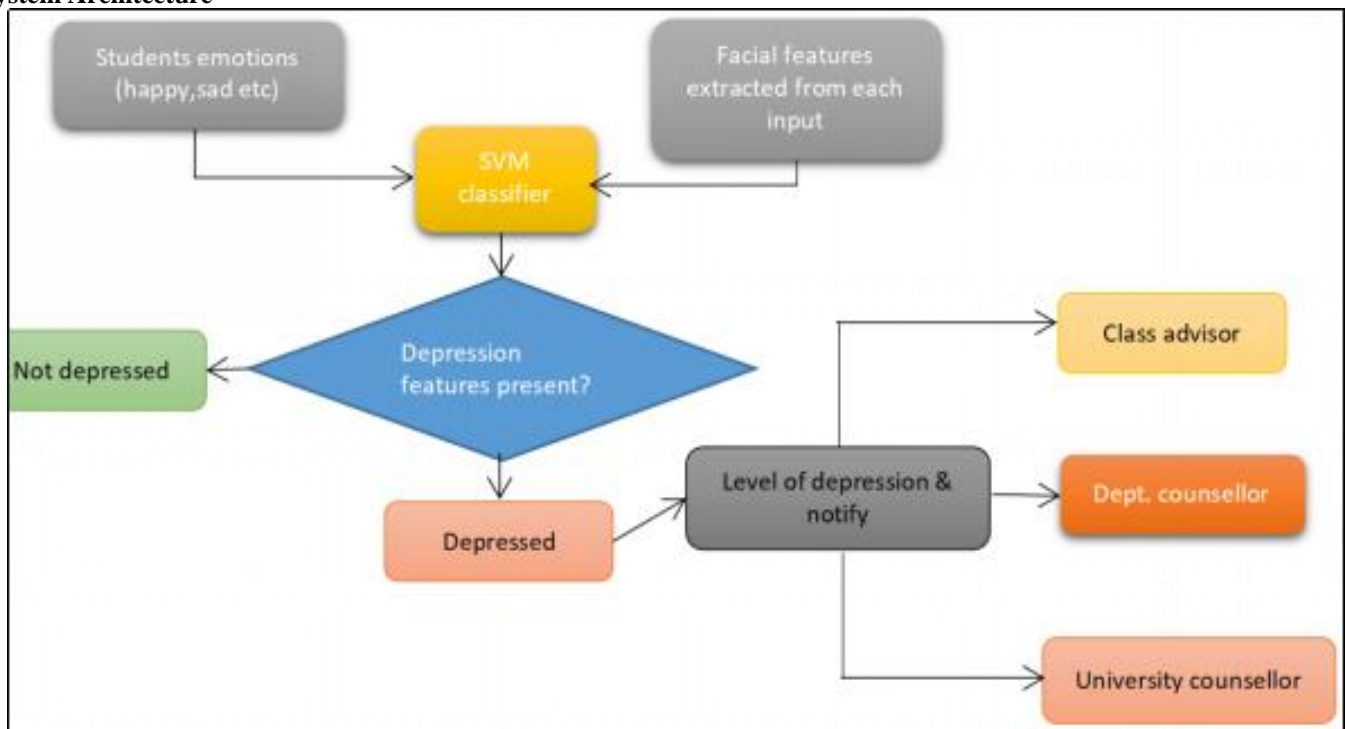
System Architecture

Fig.1 The Flowchart of detection using machine learning

Algorithm

K-Nearest Neighbors(KNN) assumes that similar things exist in close proximity. Load the data then initialize **K** to your chosen number of neighbors and calculate distance between **category A** and **category B** from the data. Add the distance and the index of example to an ordered collection. Sort the ordered collection of distances and indices in ascending order by distances. Pick the first **K** entries, get the labels of it. If regression, return the mean of the **K** labels, If classification, return the mode of the K labels. **Depression and anxiety Data-set gathering**, **Data processing**, **Data segmentation**, **Data clustering**, **Data classification**, **Comparison with input data** and **Prediction** are the **System Goals**. The **System feasibility** like **Technical** Feasibility, **Economic** Feasibility, **Motivational** Feasibility, **Schedule** Feasibility, **Operational** Feasibility are the studies which are carried out to determine whether the proposed system can be developed with the available resources.
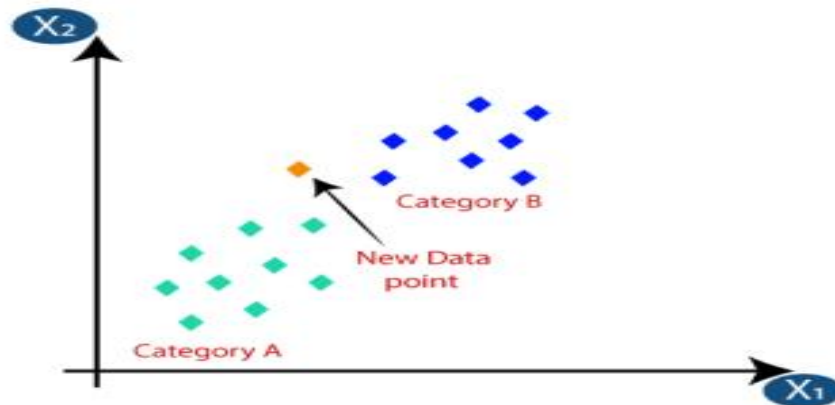

Fig.2 KNN model in Machine Learning

The Support Vector Machine(SVM) algorithm is implemented in practice using a kernel. The learning of the hyperplane in linear SVM is done by transforming the problem.   The powerful insight is that the linear **SVM can be rephrased using the inner product of any two given observations**, rather than the observations themselves. The inner product between two vectors is the sum of the multiplication of each pair of input values.

Conclusion

These days professional systems are developed a lot to help the sufferers by predicting or detecting the intellectual problems at an early level. As there are various device mastering techniques it's a needed system to examine them and pick the satisfactory that fits the domain of hobby.

In keeping with the research, there are 8 gadget learning strategies on unique datasets for various intellectual fitness troubles. It's far obvious from the effects that the three classifiers viz., Multi-layer Perceptron, Multi-class Classifier and LAD Tree produce extra correct effects than others. The information set is very minimum and in destiny, this research might get implemented to a huge data set with a view to acquire extra accuracy

Future Enhancement

 Machine learning techniques help streamline data collection and convert data into a standard format. This can lead to enhancement in identifying clinical patterns and assist with better predictions.With the help of AI and machine learning, researchers are hoping the brain can help identify mental health issues.

By applying specially designed algorithms , labs could identify different features that determine a patient's treatment. Machine learning could also assist in suicide-prevention. The classifiers need to be trained prior to the implementation of any technique in real prediction.

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