Research Article

AN EFFCIET FORCASTING MENTAL HEALTH CONDITION USING MACHINE LEARNING

Dr. P. BUJJI BABU[1] VISHNUMOLAKALA JAYALAKSHMI[2] PAGADALA NAGA VENKATA SRI HARSHA[3] PALLA KARTHIK[4] VENKATA AVINASH SADHANALA[5]

[1]Department of CSE & AI, Chalapathi Institute of Engineering and Technology, LAM, Guntur, Andhra Pradesh, India.
[2]Department of CSE & AI, Chalapathi Institute of Engineering and Technology, LAM, Guntur, Andhra Pradesh, India.
[3]Department of CSE & AI, Chalapathi Institute of Engineering and Technology, LAM, Guntur, Andhra Pradesh, India.
[4]Department of CSE & AI, Chalapathi Institute of Engineering and Technology, LAM, Guntur, Andhra Pradesh, India.
[5]Department of CSE & AI, Chalapathi Institute of Engineering and Technology, LAM, Guntur, Andhra Pradesh, India

Abstract:

Nowadays, people are becoming more and more concerned with their physical health, but mental health is not given the same level of attention. Even if they are aware that they have been afflicted by chronic mental illnesses, many people choose not to seek treatment out of fear of what others would think, a belief that they have lost their minds, a dislike of doctors, or all three. These circumstances make it urgently necessary to find a solution so that more individuals are not inclined to mental diseases. This paper focuses on forecasting mental health using deep learning approaches and machine learning algorithm that is support vector machine. Support vector machine is used to solve the existing problem, as many machine learning and deep learning techniques are helping to solve these contemporary difficulties. SVM gives more accuracy compared to other machine learning algorithms to predict the mental illness.

KEYWORDS: Machine learning, Mental Illness, Support Vector Machine, Decision Tree

1.INTRODUCTION

A person's emotions, intelligence, and capacity for interpersonal communication are unquestionably all impacted by mental illness, which is a health problem. These issues have shown that mental illness has significant societal effects and calls for fresh preventative and therapeutic approaches. Implementing these strategies requires first performing early mental health identification. Mental disease diagnoses are frequently made based on the patient's self-report, which necessitates the use of questionnaires designed to pinpoint specific emotional or social interaction patterns. With the proper treatment and care, many persons with mental illnesses or emotional disorders should be able to recover. Artificial intelligence has a branch called machine learning that is widely employed nowadays.

It is thought to be a very helpful tool for predicting mental health. It is making it possible for several researchers to gather crucial information from the data, offer tailored experiences, and create automated intelligent systems. Future occurrences have been predicted and categorised using widely used machine learning methods including support vector machines, random forests, and artificial neural networks. In addition to giving clinicians a platform to analyse a vast amount of patient data and develop individualised treatments based on the patient's medical condition, machine learning (ML) is getting more adept at diagnosing diseases. As a result of the advancement of new technology, people have grown accustomed to working from home, and numerous software and IT companies have embraced this concept. Due of this, people rarely connect with one another, and many do not live a healthy life at home. As a result, many people today struggle with despair, anxiety, and melancholy. In the modern era, people place more emphasis on their physical health than on their mental health. Even when they are conscious of the fact, they have long-term mental illnesses, many people choose not to seek treatment out of fear of being judged, the belief that they are insane, or simply because they detest doctors [1]. The major goal of this method is to design a system that can accurately and faithfully preserve original work while also detecting users' mental health in advance.

2.LITERATURE SURVEY

In paper[3], Mental Health Prediction Using Machine Learning: Taxonomy, Applications, and Challenges focuses on the use of machine learning techniques or approaches in predicting mental health problems is highlighted in a total of 30 research papers that have been reviewed and evaluated in this paper. The research papers and articles have been divided and categorized into different types of mental health problems like schizophrenia, depression, anxiety, bipolar disorder, and PTSD

3. SYSTEM ANALYSIS

3.1 EXISTING SYSTEM

The current mental health diagnosis relies primarily on subjective assessments by healthcare professionals.Diagnosis often involves lengthy interviews and questionnaires, making it time-consuming.The system is limited by the stigma associated with mental health issues, discouraging individuals from seeking help.
It is also constrained by a shortage of mental health professionals and uneven access to care.Traditional diagnostic methods lack scalability, hindering early intervention.Data collection for mental health analysis may be sporadic, incomplete, and non-standardized.The accuracy and precision of diagnosis can vary widely among practitioners.Existing technological tools for mental health diagnosis have limitations and may not be widely adopted.Patients' perspectives on mental health treatment may not be adequately considered.These challenges highlight the need for more efficient and data-driven approaches, like machine learning, to improve mental health diagnosis.

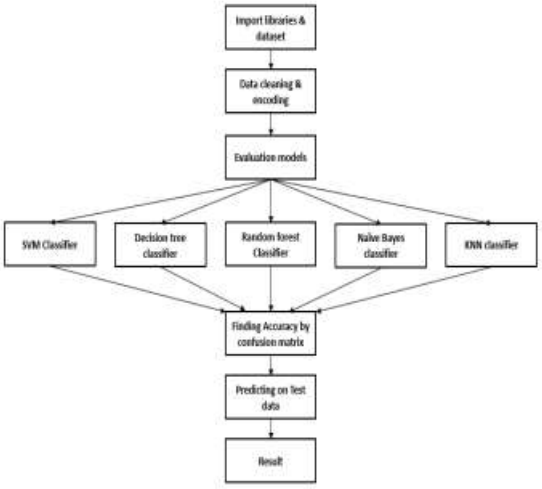
LIMITATIONS OF EXISTING SYSTEM

Scalability: Traditional diagnosis methods are time-consuming and may not scale well to meet the increasing demand for mental health services.
Access and Availability: Uneven access to mental health professionals, particularly in rural areas, can result in delayed or inadequate treatment.

3.2 PROPOSED SYSTEM

The proposed system aims to overcome the limitations of the existing mental health diagnosis framework by leveraging advanced machine learning techniques, with a primary focus on Support Vector Machine (SVM). This innovative approach will introduce a data-driven and objective dimension to mental health assessment. By analyzing a wide range of patient data, including psychological assessments, biometric indicators, and behavioral patterns, the proposed system will enable more accurate and consistent diagnoses. Moreover, it will provide a non-judgmental and stigma-free environment, encouraging individuals to seek help and participate actively in their mental health management. The scalability of the system will ensure timely and widespread access to mental health services, addressing the current scarcity of mental health professionals in some regions. By incorporating technological advancements and data-driven insights, the proposed system promises to revolutionize mental health diagnosis and provide personalized, patient-centric care, significantly improving the overall well-being of individuals dealing with mental health issues.

4.SYSTEM ARCHITECTURE



Mental condition of people should be good in today's life, so We decide to develop a mental health tracker that recognizes the user's mood and assists us in determining whether the user is suffering from a mental illness. We will also make suggestions to help him enhance his mental condition. The architecture of system is mentioned in fig 1. Support One of the most well-liked methods for supervised learning, the vector machine, is employed for both classification and regression issues. However, it is largely employed in Machine Learning Classification issues. The SVM algorithm's objective is to establish the best line or decision boundary that can divide n-dimensional space into classes, allowing us to quickly classify fresh data points in the future. A hyperplane is the name given to this optimal decision boundary. We can compare the Support Vector Machine with other classification models such as: Decision Tree, Random Forest, KNN, Naïve Bayes. machine learning methods were deployed. According to the intensity, this forecasts the proportion of people experiencing stress, anxiety, and depressive symptoms. The training and test sets are broken up into an 80:20 ratio inside the dataset.

Support Vector Machine - In the case of predicting mental health illness using a questionnaire, the SVM algorithm is trained to identify patterns in the responses that are associated with mental health conditions such as depression, anxiety, or bipolar disorder. Once the SVM model is built, it can be used to predict mental health illness by asking a set of questions to a new participant and using their responses to create a hyperplane that separates the two classes.

5.MODULES

Data Collection: Gather relevant data on individuals' mental health indicators, possibly through surveys, medical records, or digital health platforms.

Pre-processing: Clean and preprocess the collected data to ensure consistency, handle missing values, and normalize features for optimal performance.

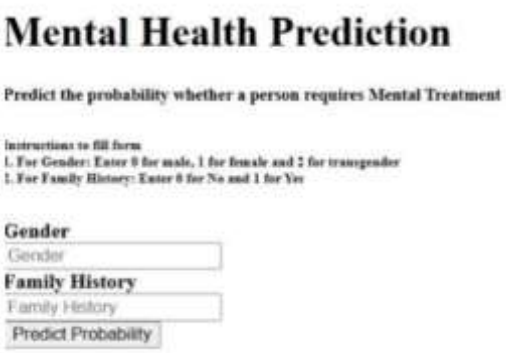
Feature Selection: Identify the most relevant features using techniques like correlation analysis or feature importance scores to enhance model efficiency.

Model Training: Utilize machine learning algorithms such as KNN, Logistic Regression, DT, and RF to train predictive models on the preprocessed data.

Model Evaluation: Assess the performance of trained models using metrics like accuracy to ensure reliability and effectiveness.

Deployment: Implement the trained models into a user-friendly interface or integrate them into existing healthcare systems for practical use in predicting mental health conditions

RESULT



7. CONCLUSION

In the medical field, there are numerous specialized programmers that can accurately and timely forecast disease, allowing for effective and efficient treatment. Today, mental health is a major problem. As more people work from home and spend less time with their loved ones, the mental health problem has gotten worse. Therefore, it is crucial to spot any problems and deal with them before they have a significant impact. The development of a mental health illness tracker using machine learning algorithms has shown great potential for aiding in the identification and monitoring of mental health symptoms and behaviours. The use of machine learning algorithms has allowed for the identification of patterns and trends in mental health data, which can help individuals, mental health professionals, and researchers to make more informed decisions and interventions. On successful implementation of Decision tree classifier, Random Forest, Naive Bayes, k- Nearest Neighbors we have found Machine algorithm gives the best results as it works for both the classification and regression task, although it was the most complex to implement. Support Classification typically employs vector machines. The exceptional classification performance and presentation quality of this classifier, which separates the data linearly into two unique classes (also known as hyperplanes) with the maximum distance between the two classes, have recently been used in numerous applications. After completing an online questionnaire on mental health conditions, a user will get to know whether they are suffering from stress levels, anxiety and depression

FUTURE SCOPE: As our main goal was to develop a predictive tool that could help healthcare workers manage caseload priorities and pre emptively intervene to mitigate the risk of crisis, we established the prediction target to align with the service-oriented approach to defining crisis7that is, the onset of severe symptoms that require substantial healthcare resources.

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