SUICIDAL THOUGHTS RECOGNITION FOR EMOTIONALLY DISTURBED PERSON USING MACHINE LEARNING

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Introduction:

Mental Health is a state of well-being in which every individual realizes his or her own potential, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to her or his community. Increases in the occurrence and global burden of mental illness have made the prevention and treatment of mental disorders a public health priority. **Artificial Intelligence (AI) may detect behavioral signs of anxiety with over 90% accuracy**. Motion sensors were able to detect such anxiety symptoms as nail-biting, knuckle cracking, hand tapping, etc.

Some researches conducted with data from adult participants where movements are recorded with use of sensors as individuals perform a series of activities in particular order. Researchers focus on specific behaviours to detect anxiety using motion sensors and deep learning techniques.

High prevalence of mental illness and the need for effective mental health care, combined with recent advances in AI, has to led to an increase in explorations of how the field of machine learning (ML) can assist in the detection, diagnosis and treatment of mental health problems.

Objectives

- Understanding various Mental Health Disorders where a person can have Suicidal Thoughts.
- To design and implement various Machine Learning classification techniques on the text Dataset.
- To Design, Develop and Evaluate classification Model.
- To integrate Natural Language Processing in the developed Machine Learning Model.

Methodology

- Collecting the required data, obtain it from various resources. The data used here is expressive emotions of people in the form of text who can be mentally disturbed. The data collected for this project is above 2 Lakh rows.

- This data is prone to be noisy with the characters or symbols generated by the system due to various reasons. The data should be cleaned and converted to a form suitable for the Machine Learning Algorithms to work.
- One of the data cleaning methods is Stemming which is used to clean the text-dataset as well as remove all the unnecessary stop words.
- Various Machine Learning Algorithms like Logistic Regression, Support Vector Machine, Random Forest, Decision Tree are used to train and test the Model. The Algorithm giving best accuracy for testing dataset is chosen.
- As the model is ready, we take the input speech from the user, convert it to text using Natural Language Processing and apply our algorithm to classify whether these thoughts are Suicidal or not.

FLOW DIAGRAM
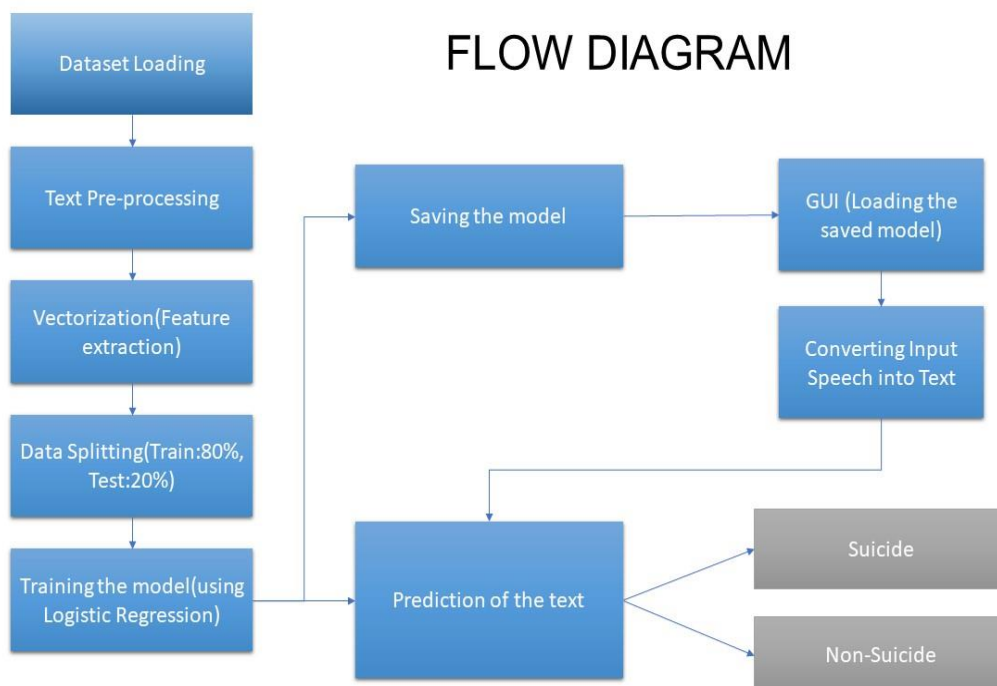
Results and Conclusion:

As mentioned above we tried with various algorithms and chose one based on its accuracy. Below are the accuracy rates of the algorithms:

- Logistic Regression : 93%
- Support Vector Machine :91%
- Random Forest : 81%
- Decision Tree : 85%

Hence, we carried out the modelling using Logistic Regression. Wherein our model, for a given input audio converts it into text and classifies it to be suicidal or non-suicidal.

Many different techniques and algorithms can be introduced and proposed to test and solve the mental health problems. There are still many solutions that can be refined. In addition, there are still many problems to be discovered and tested using a wide variety of settings in machine learning for the mental health domain. As classifying the mental health data is

generally a very challenging problem, the features used in the machine learning algorithms will significantly affect the performance of the classification.

Therefore, it is essential to develop new methods, to heal schism between clinical mental health detection and automatic machine detection. With this project we try to predict the suicidal thoughts and try bringing a alternative solution other than available clinical methods.

Scope for future work:

This project would be of great help in recognizing the suicidal thoughts of an individual through text or speech. Future work is encouraged to improve conceptualization and definition of suicidal thoughts and also provide sufficient detail regarding the operationalization of suicidal thoughts. As per the requirement, by consulting the experts we can have necessary changes made and improve the overall model.