K.K.WAGH INSTITUTE OF ENGINEERING EDUCATION & RESEARCH

Depression Classification Model Using Machine Learning

Group Id- 05
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External Guide-

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Problem Definition

- To develop an automated depression detection system using machine learning

- Technical Keywords: Depression severity detection, Speech processing, PHQ-9, DIAC-WOZ, SVM, KNN ,COVAREP and MLPClassifier

Requirement Specification

- To classify the severity of depression in a person
- IDE visual studio
- Cloud Servers
- Good quality of camera and microphone

Literature Survey

Paper	Objective	Algorithm	Disadvantages
The PHQ-8 as a measure of current depression in the general population(2014)	To classify the type of depression severity based on answers	Decision Tree Classifier	Less accurate
Accuracy of Patient Health Questionnaire-9(PHQ-9) for screening to detect major depression(2019)	To classify severity of depression with more accuracy based on answers	Decision Tree Classifier	Less accurate and time consuming
Tracking depression severity from audio and video based on speech articulatory coordination(2019)	Feature extraction to determine severity of depression	MLPClassifier/K-neares t neighbour	It is time consuming

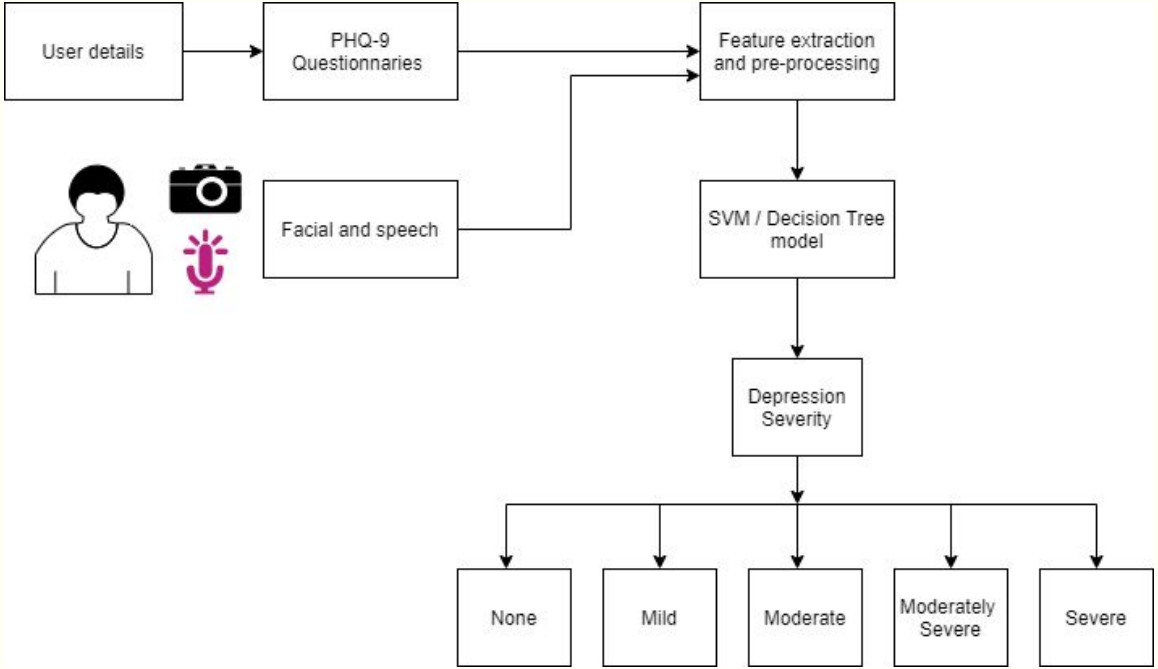
Motivation of the Project

- Globally, more than 264 million people of all ages suffer from depression
- Depression affect one in every 15 adults in a given area and risk in women is twice than men
- Depression causes suicidal tendencies in many human beings
- People consider depression as an insensitive topic
- Depression can result in many health related problems

Objectives

- To build a system based on machine learning for predicting the depression severity levels in people
- To reduce the time required by the doctor for diagnosis by automating the diagnosis procedure

Block diagram of Project/Architecture



Methodology

- Model is divided into 2 parts and 3 different inputs
- PHQ-9 Questionnaire
- Collecting audio and video samples
- Required features extraction for further classification
- Data sets required for this are DIAC-WOZ and Dlib numbers
- SVM/ Decision tree machine learning approach
- Frames and sample comparison

Algorithms

- SVM(Support Vector Machine)
  - Step 1: Collecting image samples
  - Step 2: Converting RGB images to grayscale images
  - Step 3: Extracting required features
  - Step 4: Training the samples as depressed or not depressed
  - Step 5: Classifying the target/test samples by comparing with trained data

- Decision Tree Classifier
  - Step 1: Collecting the input for the questionnaire
  - Step 2: Processing the collected data
  - Step 3: Classifying the data depending on the rules
  - Step 4: Predicting the class label of the data

Experimental Setup

- Images captured are first converted into grey scales images
- These grey scale images are compared for feature extraction
- The audio samples will be compared for feature extraction
- The noise in the image and audio samples will be removed

Performance Parameter

The severity of depression will be calculated based on the accuracy of the model

- Precision
- Confusion Matrix
- Error rate
- Hyperdash

Efficiency Issues

- Misclassification of Dlib numbers because of noise
- Large execution time
- Good internet connectivity and hardware availability

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THANK YOU !!

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