

# MENTAL HEALTH PREDICTION USING MACHINE LEARNING

Submitted By,  
Kevin G Kuriakose

## 1. INTRODUCTION :

### a. *Overview :*

Mental Health First Aid teaches participants how to notice and support an individual who may be experiencing a mental health or substance use concern or crisis and connect them with the appropriate employee resources.

Employers can offer robust benefits packages to support employees who go through mental health issues. That includes Employee Assistance Programs, Wellness programs that focus on mental and physical health, Health and Disability Insurance, or flexible working schedules or time off policies. Organizations that incorporate mental health awareness help to create a healthy and productive work environment that reduces the stigma associated with mental illness, increases the organizations' mental health literacy, and teaches the skills to safely and responsibly respond to a co-worker's mental health concern.

### b. *Purpose:*

The main purpose of the Mental Health Prediction system is to

predict whether a person needs to seek Mental health treatment or not based on inputs provided by them.

We will be using classification algorithms such as Logistic Regression, KNN, Decision tree, Random Forest, AdaBoost, GradientBoost, and XGBoost. We will train and test the data with these algorithms. From this, the best model is selected and saved in pkl format. We will also be deploying our model locally using

## Project Objectives

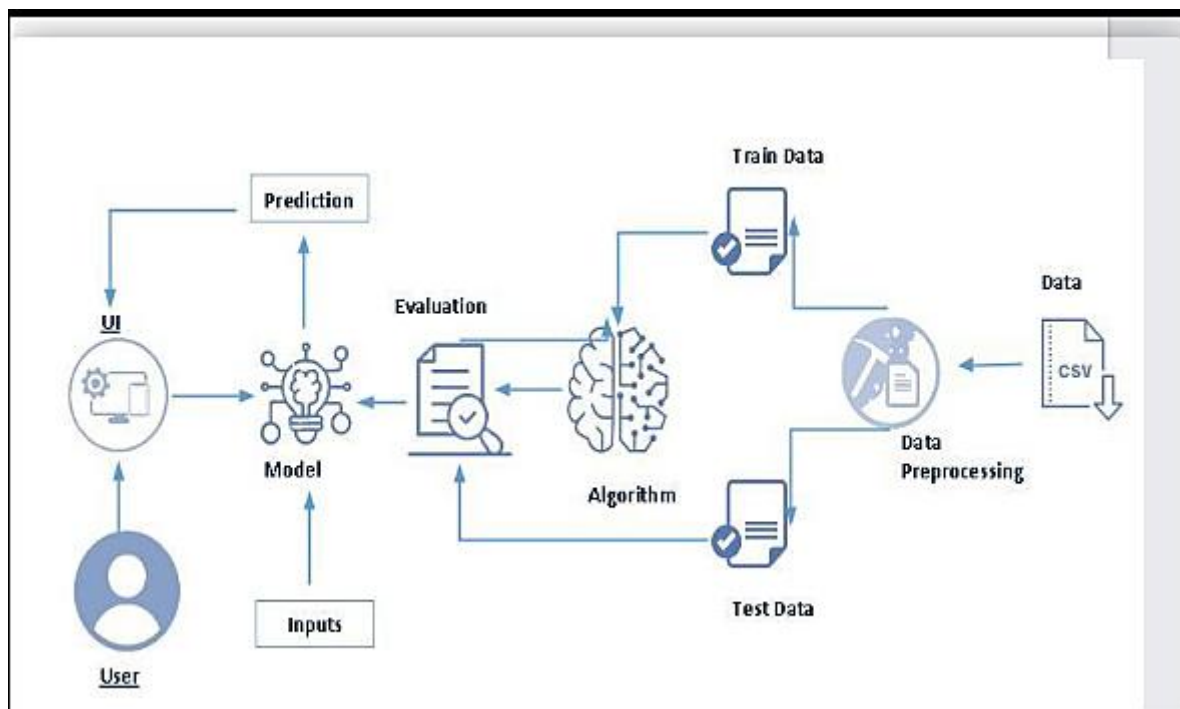
By the end of this project you will:

- Know fundamental concepts and techniques used for machine learning.
- Gain a broad understanding of data.
- Have knowledge of pre-processing the data/transformation techniques and some visualization concepts before building the model
- Learn how to build a machine learning model and tune it for better performance
- Know how to evaluate the model and deploy it using flask

### 3. THEORITICAL ANALYSIS:

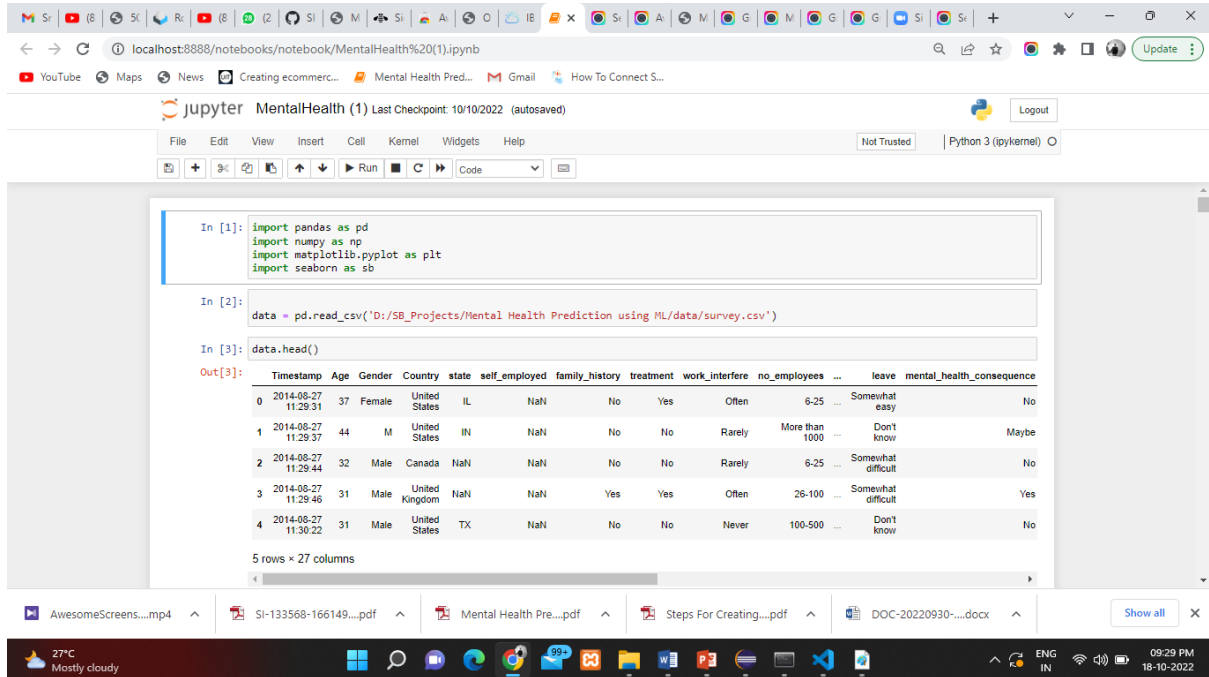
a. *Block Diagram:*

*Architecture:*



## 4. EXPERIMENTAL INVESTIGATIONS:

### *Training the train dataset:*



The screenshot displays a Jupyter Notebook environment. The top bar shows the URL `localhost:8888/notebooks/notebook/MentalHealth%20(1).ipynb`. The notebook title is "MentalHealth (1) Last Checkpoint: 10/10/2022 (autosaved)". The interface includes a menu bar (File, Edit, View, Insert, Cell, Kernel, Widgets, Help) and a toolbar with icons for file operations, running cells, and code execution. The code cell contains the following Python code:

```
In [1]: import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sb

In [2]: data = pd.read_csv('D:/SB_Projects/Mental Health Prediction using ML/data/survey.csv')

In [3]: data.head()
```

The output of the code execution is a preview of the first five rows of the dataset:

	Timestamp	Age	Gender	Country	state	self_employed	family_history	treatment	work_interfere	no_employees	...	leave	mental_health_consequence
0	2014-08-27 11:29:31	37	Female	United States	IL	NaN	No	Yes	Often	6-25	...	Somewhat easy	No
1	2014-08-27 11:29:37	44	M	United States	IN	NaN	No	No	Rarely	More than 1000	...	Don't know	Maybe
2	2014-08-27 11:29:44	32	Male	Canada	NaN	NaN	No	No	Rarely	6-25	...	Somewhat difficult	No
3	2014-08-27 11:29:46	31	Male	United Kingdom	NaN	NaN	Yes	Yes	Often	26-100	...	Somewhat difficult	Yes
4	2014-08-27 11:30:22	31	Male	United States	TX	NaN	No	No	Never	100-500	...	Don't know	No

The bottom of the screen shows a Windows taskbar with the system clock at 09:29 PM on 18-10-2022.

## 5.flowchart

## **7. ADVANTAGES AND DISADVANTAGES:**

### ***Advantages:***

☑ **help determine key behavioral biomarkers to aid mental health professionals in deciding if a patient is at risk of developing a particular mental health disorder.**

☑ Additionally the algorithms may assist in tracking effectiveness of a treatment plan

☑ ***using our Application the mental health can be predicted easily and suicide can be avoided***

### ***Disadvantages:***

☑ ***The main disadvantage is our application provides only 94.5% of results cant provide 100% result***

## **8. APPLICATIONS:**

● It will help people to find about their mental health and depression problems.

● As a result anxiety problems committing suicides will be avoided

## **9. CONCLUSION:**

Many different techniques and algorithms had been 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.

The existing studies and research show that machine learning can be a useful tool

in helping understand psychiatric disorders. Besides that, it may also help distinguish and classify the mental health problems among patients for further treatment. Newer approaches that use data that arise from the integration of various sensor modalities present in technologically advanced devices have proven to be a convenient resource to recognize the mood state and responses from patients among others.

## **10. FUTURE SCOPE:**

The increase of mental health problems and the need for effective medical health care have led to an investigation of machine learning that can be applied in mental health problems.

This paper presents a recent systematic review of machine learning approaches in predicting mental health problems. Furthermore, we will discuss the challenges, limitations, and future directions for the application of machine learning in the mental health field

## **11. BIBLIOGRAPHY**

1. Environment Setup: <https://www.youtube.com/watch?v=5mDYijMfSzs>
2. Sign Languages Dataset: <https://drive.google.com/file/d/1CSTYNw3pbvPozlFxxNOuDyRCgm6A5vid/view?usp=sharing>
3. Keras Image Processing Doc: <https://keras.io/api/preprocessing/image/>
4. Keras Image Dataset From Directory Doc: <https://keras.io/api/preprocessing/image/#imagedatasetfromdirectory-function>
5. CNN using Tensorflow: [https://www.youtube.com/watch?v=umGJ30-15\\_A](https://www.youtube.com/watch?v=umGJ30-15_A)
6. OpenCV Basics of Processing Image: <https://www.youtube.com/watch?v=mjKd1Tzl70I>
7. Flask Basics: [https://www.youtube.com/watch?v=lj4I\\_CvBnt0](https://www.youtube.com/watch?v=lj4I_CvBnt0)

## **APPENDIX:**

*Training and testing the dataset*

## Output Screenshots:

