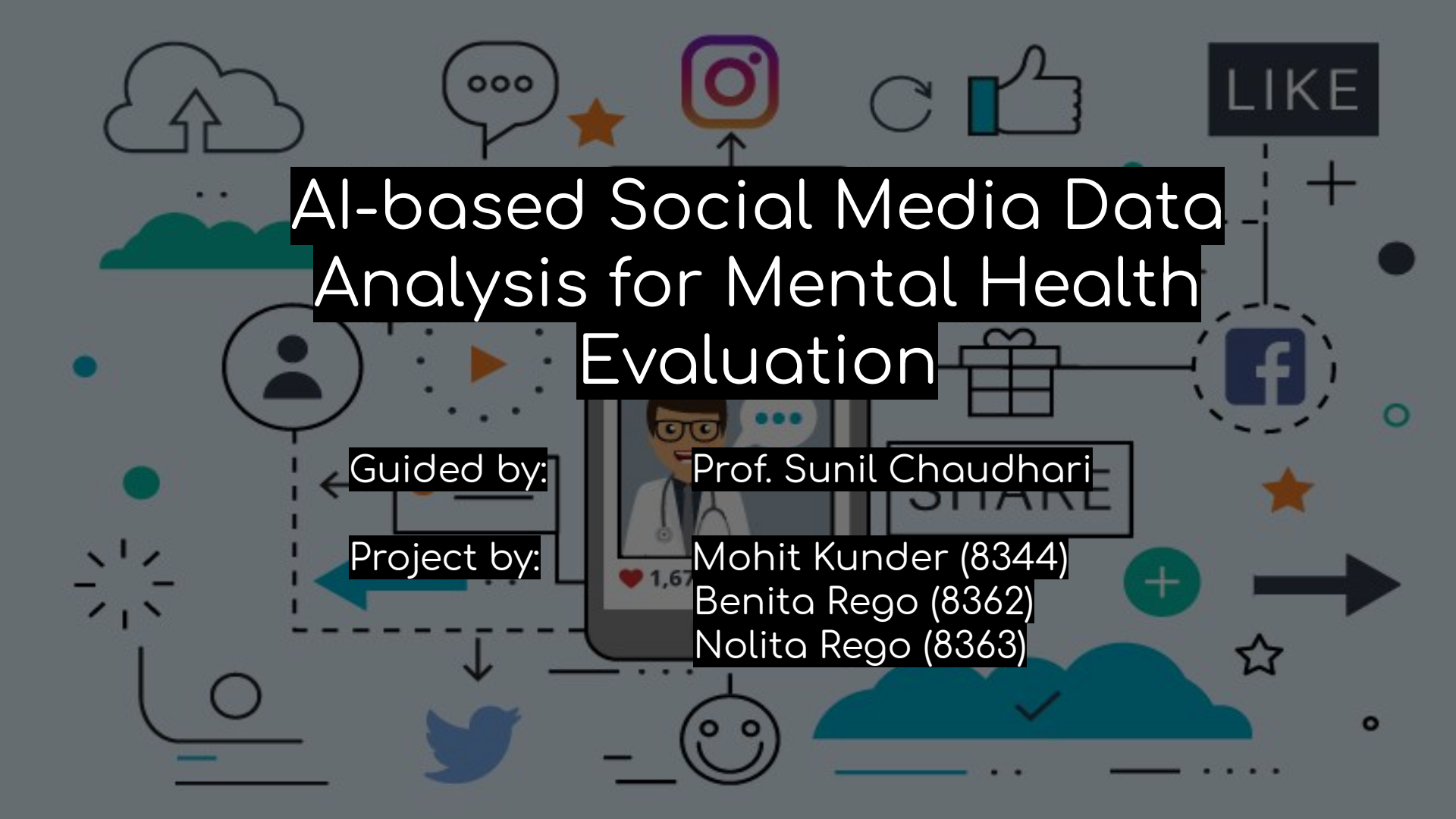

AI-based Social Media Data Analysis for Mental Health Evaluation

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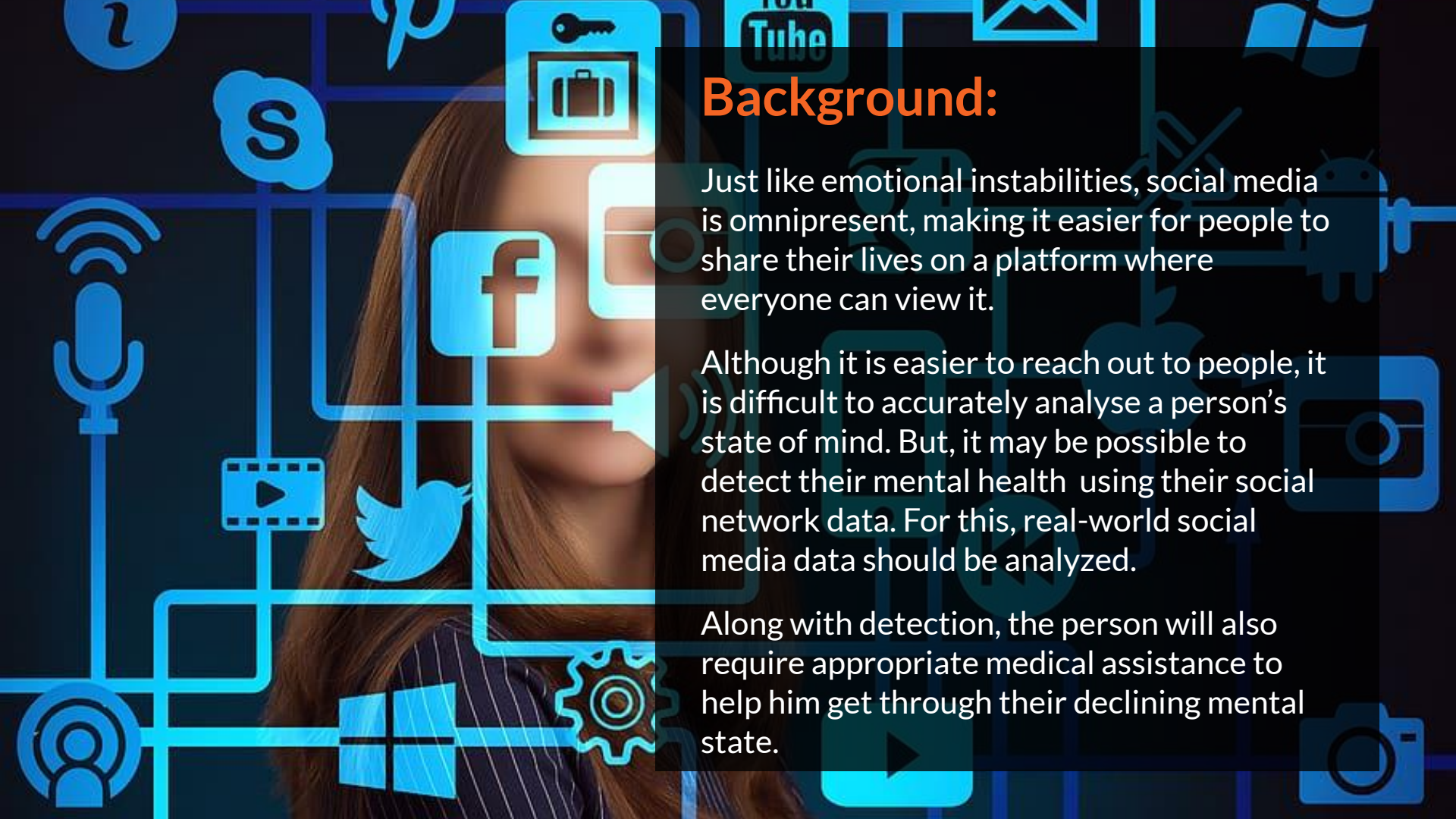
Introduction:

- Mental illnesses, such as depression, are highly prevalent and have been shown to impact an individual's physical health.
- Recently, artificial intelligence (AI) methods have been introduced to assist mental health providers, including psychiatrists and psychologists, for decision-making based on patients' historical data (e.g., medical records, behavioral data, social media usage, etc.).
- Deep learning (DL), as one of the most recent generation of AI technologies, has demonstrated superior performance in many real-world applications ranging from computer vision to healthcare.



Background:

Just like emotional instabilities, social media is omnipresent, making it easier for people to share their lives on a platform where everyone can view it.

Although it is easier to reach out to people, it is difficult to accurately analyse a person's state of mind. But, it may be possible to detect their mental health using their social network data. For this, real-world social media data should be analyzed.

Along with detection, the person will also require appropriate medical assistance to help him get through their declining mental state.

Literature Review:

Researchers have been probing to find novel methods for mental health analysis. Surveys have found that social computing is one of the relevant way to examine a person's mental state. Various models are available for analysis of social media contents that depend on certain variables like posts, tweets, likes, comments on several social media platforms like Instagram, Twitter, etc. These models predict based on the live data that is collected, providing appropriate results. Furthermore, there are many algorithms used for this purpose:

- CNN (84.2%)
- Support vector machines (81.71%)
- Naïve Bayes (77.42%)
- Random Forest (73.8%)
- K-Nearest Neighbours (55.55%)

Problem Definition:

Analyzing a person's state of mind through their social media contents and providing resources to help said person find appropriate assistance.

- ➔ User's live Social Media data
- ➔ Periodic Statistics and Analysis
- ➔ Alert the user if the stress level exceeds a certain limit and recommending appropriate assistance
- ➔ Displaying locations of nearby counselling firms when required

Dashboard

Projects & Apps

Overview

STANDALONE APPS

Stress Detector

Products NEW

Account

Stress Detector

Settings Keys and tokens

Consumer Keys

On 01/12/2021 your consumer keys will no longer be visible.

To increase security, make sure to save your keys before they're permanently hidden. Select View keys below and save them somewhere safe.

API key & secret View Keys Regenerate

Authentication Tokens

Helpful docs

- How to use projects
- App permissions
- Authentication overview
- Authentication best practices
- Using bearer tokens

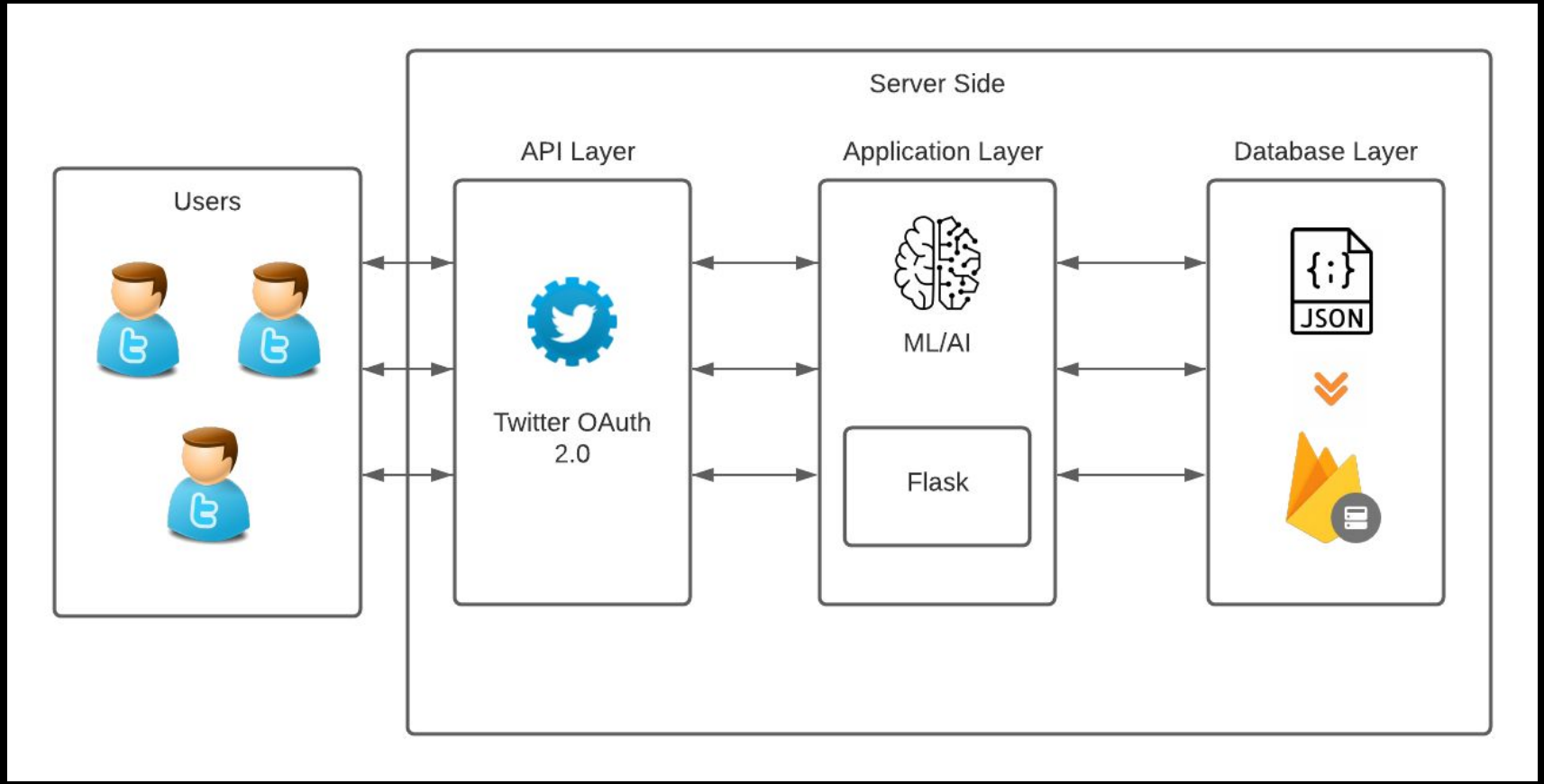
Objectives:

- Data collection from user's Twitter Handle
- Analyze the user's state of mind and provide him with periodic reports in a graphical format.
- Build a responsive UI
- Detect early stages of depression using said graph.
- Make user aware of their own declining mental state so that they can seek medical assistance or any kind of help.
- Giving appropriate medical help by displaying nearby counselling firms.

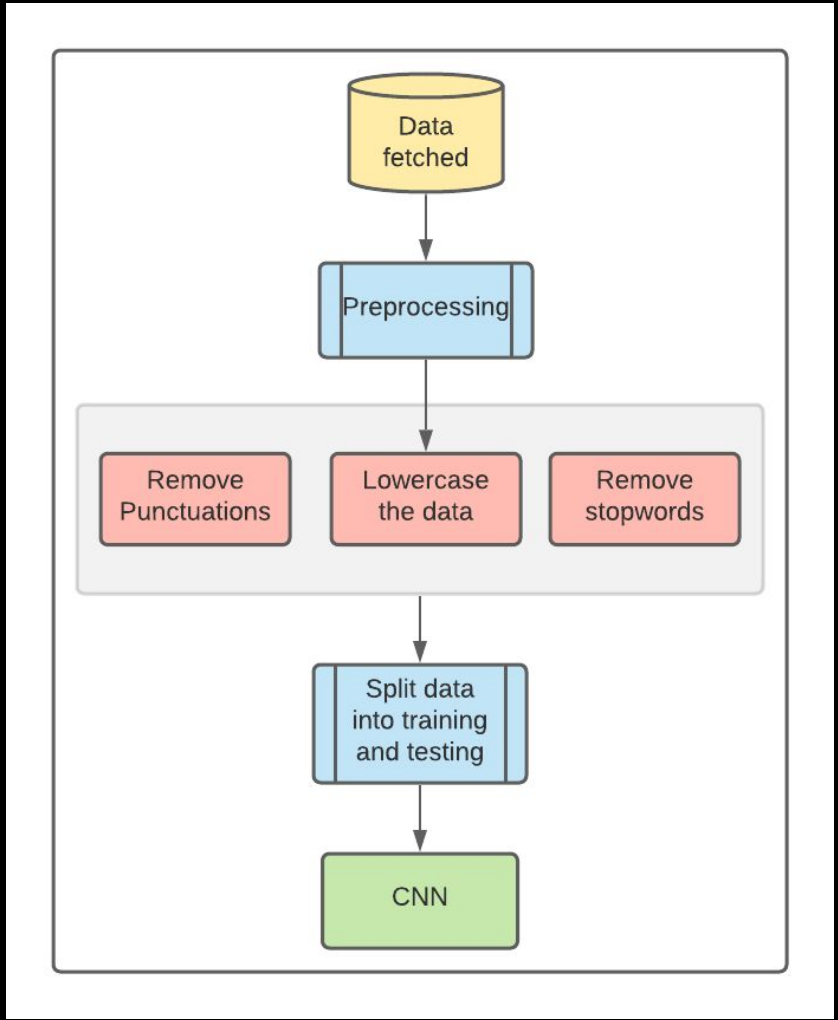
Scope:

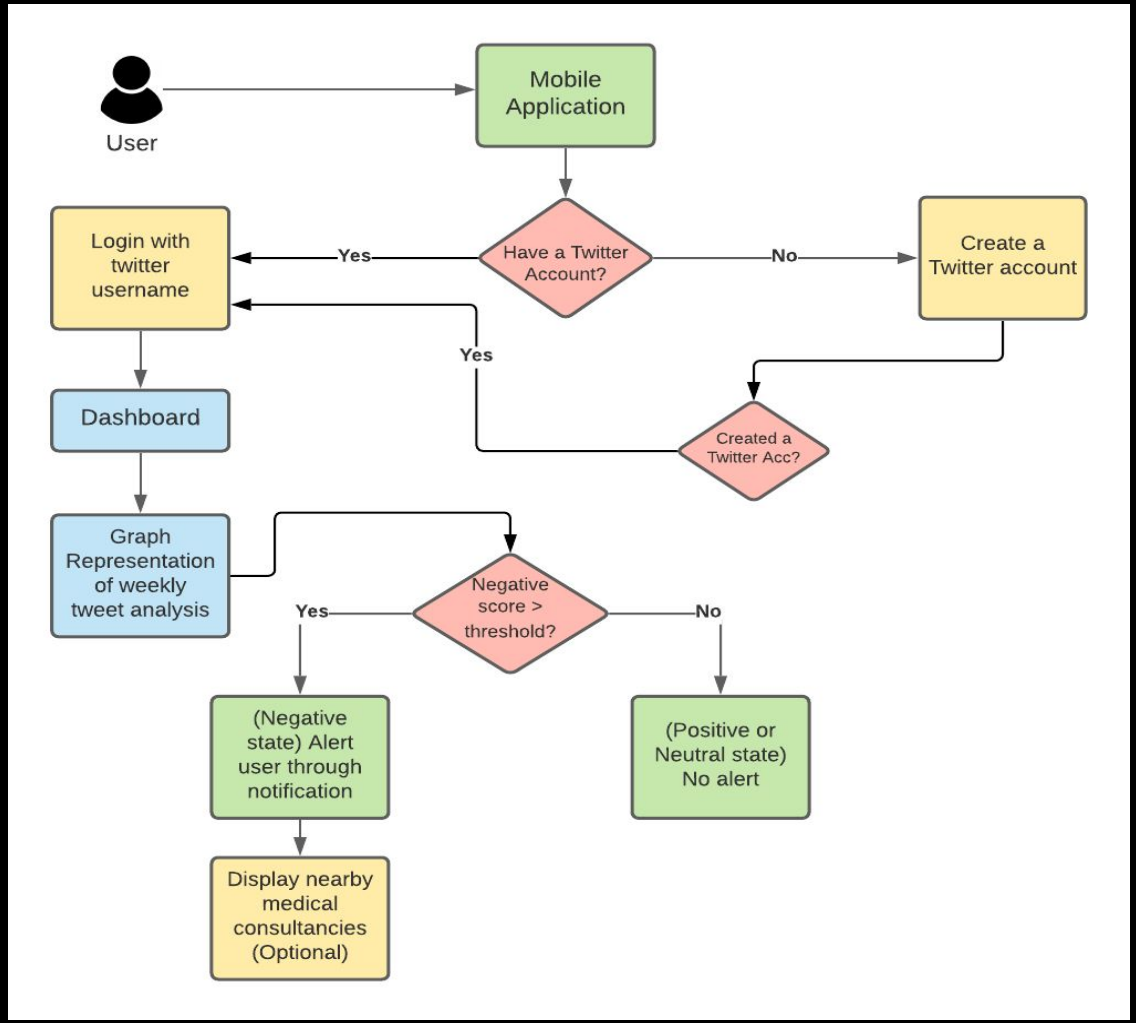
- Early stages detection of negative factors like depression and stress through live streaming data.
- Social media content assessment would help the user to get a clear picture, creating awareness within him about his psychological changes.
- Providing medical assistance by recommending health experts would help the user overcome from the negative changes he is suffering from.

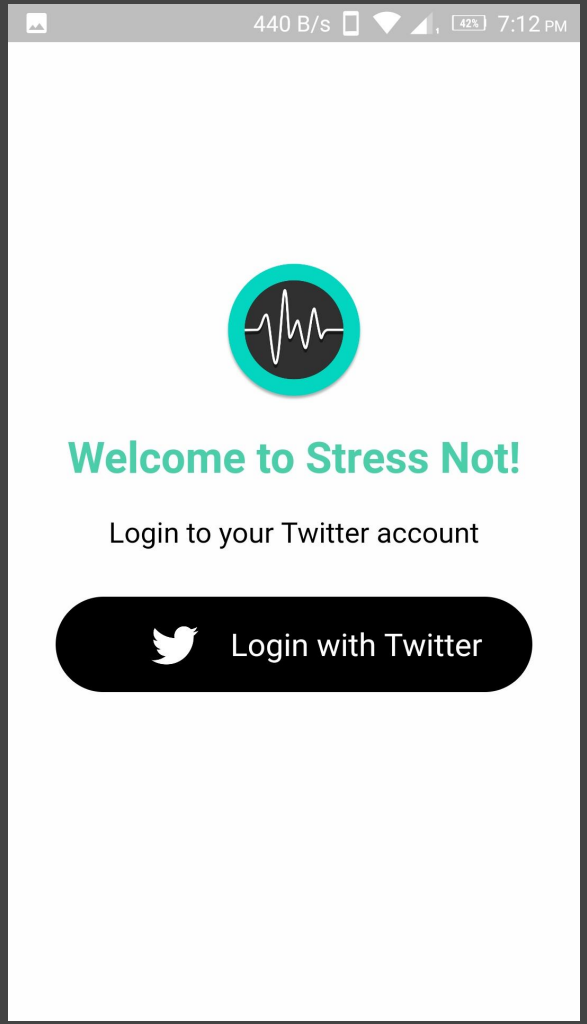
Architecture (Complete System)

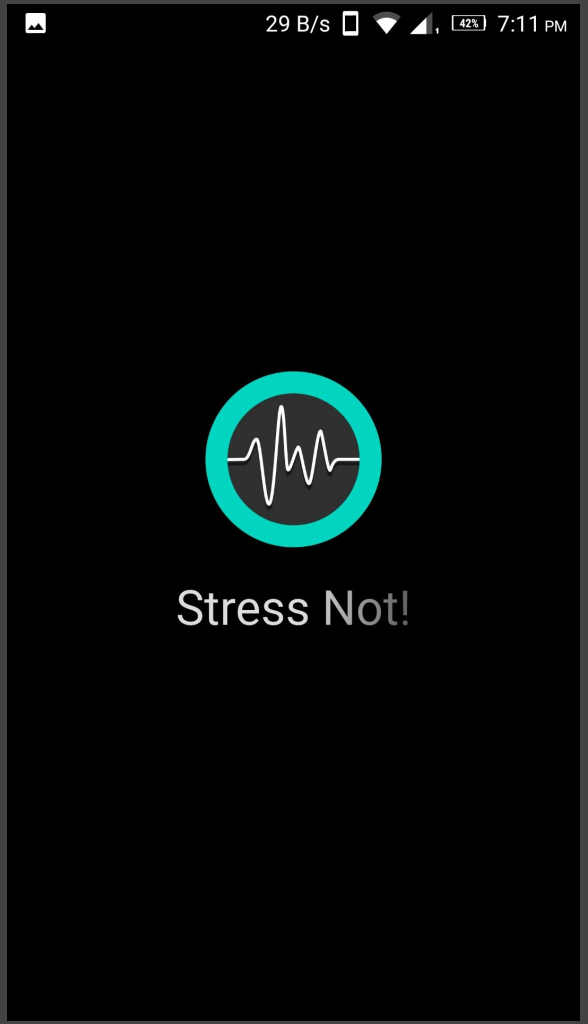


Architecture: (Model)




User
Mobile Application
Have a Twitter Account?
Yes
No
Login with twitter username
Create a Twitter account
Yes
Dashboard
Created a Twitter Acc?
Graph Representation of weekly tweet analysis
Negative score > threshold?
Yes
No
(Negative state) Alert user through notification
(Positive or Neutral state) No alert
Display nearby medical consultancies (Optional)


440 B/s 42% 7:12 PM
Welcome to Stress Not!
Login to your Twitter account
Login with Twitter


29 B/s 42% 7:11 PM
Stress Not!

Technologies:

Flutter (UI)

Realtime Firestore (Database)

Flask (Backend Server)

Twitter OAuth 2.0 (Live Data)

Natural language Processing

Keras

Gensim

Convolutional Neural Network

References:

- [1] “Deep Learning for Depression Detection of Twitter Users” - University of Ottawa, Canada, January 2018
- [2] “Detecting Stress Based on Social Interactions in Social Networks” - Journal of Latex Class Files, Vol-13, September 2014
- [3] “Stress Detection Methodology based on Social Media Network: A Proposed Design” -IJITEE ISSN: 2278-3075, Vol-9 Issue-3, January 2020
- [4] “Sentiment Analysis/Text Classification Using CNN (Convolutional Neural Network) - Towards Data Science (Accessed 30 July. 2020)

Thank you!