AUGUST 18, 2021

National Institute of Technology, Hamirpur

Department of Electronics and Communication Engineering

Psychopathology Companion for Employees

-MINOR PROJECT SYNOPSIS

Submitted by:

(Team Leader) Arush Singh Koundal - 184522
Yuvraj Santosh Kadale - 184534
Mohit Mukamia - 184519
Amandeep Singh - 184513

Submitted To:

Dr. Dharmendra Singh Yadav
E&CE Dept.

I. INTRODUCTION

Mental Stress, as a psychological phenomenon or emotional pressure, has a lot to deal with neurological and physiological aspects of the human body. There are experiments to determine stress using heart rate sensors (or) using physiological signals based on soft computing techniques (or) implementing wearable sensors around the body. However, the problem of wearing the sensors and electrodes around the body for a long time is present. These methods are not accurate as well.Our method is an intelligent assistant platform to track psychopathology patients' responses during face-to-face and remote sessions. This platform makes use of a machine learning algorithm capable of tracking and detecting facial expressions to identify associated emotions through a camera. This allows the corresponding medical staff to take care of their patients by creating medical records supported by the artificially intelligent system, so they can follow-up the corresponding treatments.

II. LITERATURE SURVEY

According to a study published in the past and present, one out of every two employees in corporate India exhibits signs of anxiety and depression. Over 6000 employees from various cities and organisations voluntarily completed the depression scale in a study conducted by 1to1Help, a professional counselling company, on The Mental Health Status of Employees in Corporate India.
The following are the study's findings:

- 8% percent of respondents with anxiety symptoms
- And 55% with depression symptoms had been dealing with it for more than a year before seeking professional help.
- According to the study, the number of people at risk of suicidal behaviour has increased from 2.1 on the scale of 10 (in 2008) to 8.2 out of 10 by July 2016.

Inspiration:

Inspired from Samsung's robotic mouse that "runs away" when the workday is over. This is done in order to maintain the work life balance. Maintaining a work-life balance is hard, or is it? If you go down the Samsung way, then striking this balance will be somewhat of a compulsion leaving you not much of choice. At the risk of sounding loopy, the Samsung Balance Mouse literally runs away if you're working too much.

Facial expressions reflect a person's internal feelings and play an important role in nonverbal communication. Sharifa Alghowinem et al. [1] examine the eye movements of depressed people. The performance of eye movement features for a binary classification task (depressed vs. non-depressed) was examined, with these features extracted from face videos using Active Appearance Models.
Rajesh Kumar G A et al. [2] proposed a better method for predicting human emotions (Frames by Frames) using a deep Convolutional Neural Network (CNN) and how emotion intensity changes on a face from a low to a high level of emotion. The FERC-2013 database was used for training. This proposed experiment yields a positive result. Another good approach to check depression status was proposed by Sudha Tushara and Yanqing Zhang. [3] The researchers examined tweets about depression and anti-depression and created a new parameter that indicates the depressive level on that particular day. When compared to previous data, this parameter will aid social scientists in the study of psychotherapy (after burn) and agitated depression

levels in order to promote mental health and psychosocial interventions, as well as long-term development goals.

III. OBJECTIVE

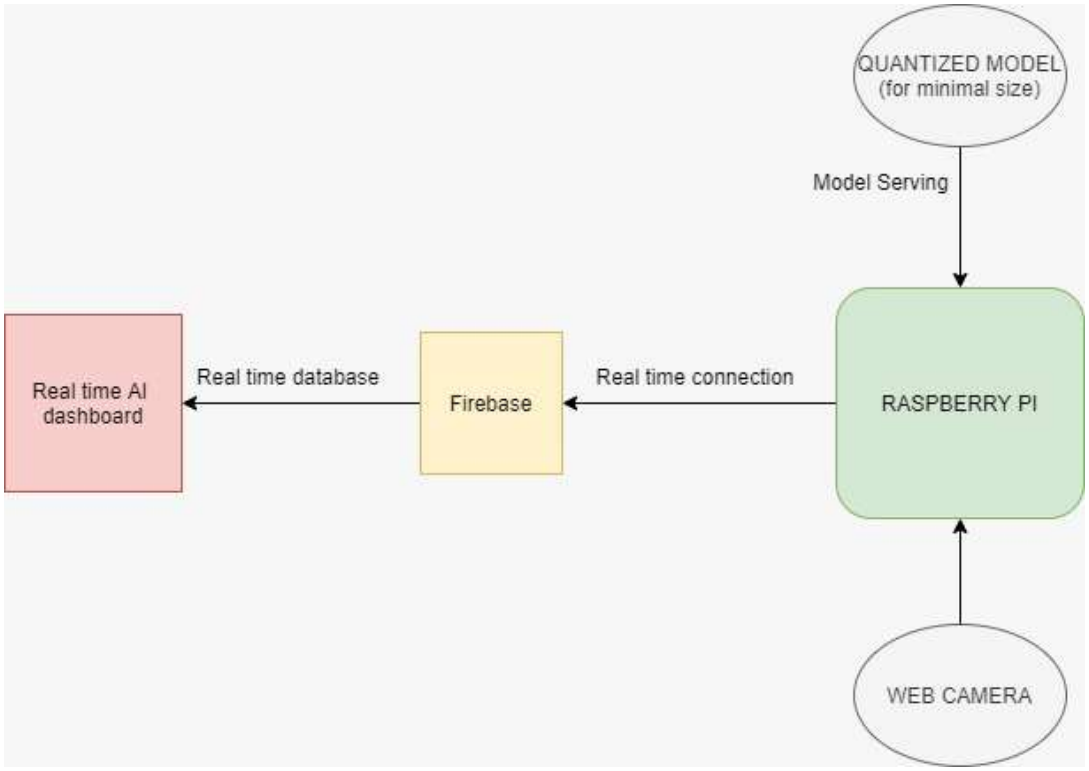
In this project we aim to help employees who suffer from depression or mentally unstable conditions due to several psychosocial causes and the health workers who work in the field of mental health. **Psychopathology** is a term which refers to either the study of mental illness or mental distress or the manifestation of behaviours and experiences which may be indicative of mental illness or psychological impairment.

Our main focus and goal in this project is to provide aid to mental health workers to identify and tackle certain disease oriented problems and better and easy working tools. This project focuses on the introduction of a platform that makes use of a machine learning algorithm capable of tracking and detecting facial expressions to identify associated emotions through a camera. This allows the corresponding medical staff to analyse and take care of their patients' conditions by creating medical records supported by the artificially intelligent system, so they can follow-up the corresponding treatment plan.

IV. METHODOLOGY

The entire methodology of the project can be divided into four sub parts:

- Data exploration
- Model training
- Web application
- Model serving



Draft for Workflow for implementation

REFERENCES

[1] S. Alghowinem, R. Goecke, M. Wagner, G. Parker and M. Breakspear, "Eye movement analysis for depression detection", *2013 IEEE International Conference on Image Processing*, pp. 4220-4224, 2013.

[2] G. A. R. Kumar, R. K. Kumar and G. Sanyal, "Facial emotion analysis using deep convolution neural network", *2017 International Conference on Signal Processing and Communication (ICSPC)*, pp. 369-374, 2017.

[3] Sudha Tushara Sadasivuni; Yanqing Zhang "A New Method for Discovering Daily Depression from Tweets to Monitor Peoples Depression Status",*2020 IEEE International Conference on Humanized Computing and Communication with Artificial Intelligence (HCCAI).*