Stress out

Project Overview

The "Stress out" web application can detect the level of depression by identifying their photos and quiz answers. In addition, the product can give users relevant tips to reduce depression and will recommend nearby recommends hospitals and doctors. The programming language used in this system is Python. React js, Html, CSS, and JavaScript are used on the front end, and MySQL is used on the back end. Here, we have used the Django framework.

Key Features

The key features of the Stress out web application include:

- **Picture Analysis**: The app can allow users to take or upload a picture and analyze it using computer vision techniques to identify facial expressions that may indicate depression.
- **Security:** The app should be designed with robust security measures to protect user data.
- **Feedback mechanism:** By allowing the end-user to provide feedback on the services they have used, the program ensures quality control.

Project Design

Architecture Overview

The Stress out web application is built using a client-server architecture, with the front-end implemented in React JS, the backend in Node JS. The database system used is MySQL.

Front-end Design

The front-end of the Stress out web application is designed using React JS, a popular framework for building single-page applications. The front-end design includes the following components:

- **User Interface**: The user interface is designed to be intuitive and user-friendly, with clear and concise layouts and color schemes, which can be easily navigated by users.
- **Navigation**: The navigation system is designed to provide easy access to all the features of the application, with clearly labeled menus and icons.
- **Input Fields and interactive**: Input fields and Picture Analysis are designed to be easy to use, with clear instructions. The interactive components, including buttons and links, are made to be responsive and easy to use.

Back-end Design

The back end of the Stress out web application is designed using Node JS, a popular framework for building scalable and performant applications. The back-end design includes the following components:

- **FASTAPI:** The endpoint uses the Fast API library and can be accessed using HTTP GET or POST URL requests.
- **Database Access:** To store and retrieve users' details and images, the back end communicates with the MySQL database system.
- **Server**: servers we are using node.js, which after the request has been processed then interacts with the Firebase database servers. Firebase provides authentication, storage and database through firestorm.

Object Detection using machine Learning model.

One of the key features of the Stress out web application is its ability to detect users' pictures This is accomplished using a machine learning model for object detection.

How to use machine Learning model to detect depression

We developed a convolutional neural network (CNN) for our machine learning model, which comprises four convolutional layers, followed by two fully connected layers and an output layer. The input shape is (200, 200, 1), and the output class has two categories.

The convolutional layers have filter sizes of (3,3), with 128, 256, 512, and 512 filters respectively. The stride and padding are not explicitly specified, so they default to a stride of (1,1) and 'valid' padding. Each convolutional layer is followed by a max pooling layer with a pool size of (2,2) and a dropout layer with a rate of 0.4.

The two fully connected layers contain 512 and 256 neurons respectively, followed by dropout layers with rates of 0.4 and 0.3 respectively. The output layer has two neurons and uses the SoftMax activation function.

We trained the model using the Adam optimizer and the categorical cross-entropy loss function. To prevent overfitting, we used an early stopping callback that stops training if the validation loss does not improve for 10 epochs. The model's weights are initialized and updated automatically during training to minimize the loss function.

Benefits of depression Detection using machine Learning model

- **Improved accuracy**: Compared to conventional rule-based approaches, object detection utilizing machine learning models can produce results with higher accuracy. This is because machine learning models can learn from large amounts of data and recognize patterns that humans may not be able to detect.
- **Faster processing**: Machine learning models can process images much faster This

means that object detection using machine learning models can be done in real-time, which is useful in applications such as self-driving cars, surveillance systems, and robotics.

- **Scalability**: Machine learning models can be trained on large amounts of data, and the same model can be used to detect objects in different settings. This makes it easier to scale object detection systems to different use cases and environments.
- **Automation**: Automated object detection utilizing machine learning models can be used to find things in huge datasets without the assistance of a human. In applications like image and video annotation, which can be time-consuming and expensive when done manually, this makes it helpful.

Deployment

The Stress out web application is deployed on a cloud platform named Amazon Web Services (AWS). The front-end and back-end components can be deployed separately to ensure scalability and reliability.

Technology Stack:

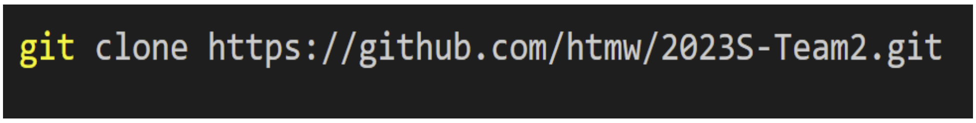
- Framework: React JS
- Backend: Node JS
- Database: MySQL
- Code Editor: Visual Studio Code

Installation:

Source code Link:

https://github.com/htmw/2023S-Team2/tree/main/Depression_detection(source%20code)

- install VS code from https://code.visualstudio.com/download.
- Clone the repository.



```
git clone https://github.com/htmw/2023S-Team2.git
```

- Install NodeJS LTS version from https://nodejs.org/en/ for your Operating System.
- Navigate to Depression detection (source code) and install required libraries:

```
npm install
```

- Run the React Server:

```
npm start
```