

DEPRESSION ANALYSIS

LIBRARIES:

- **TKINTER:** A Python standard library used for creating graphical user interfaces (GUI). It provides various GUI elements like windows, buttons, labels, etc., and allows developers to create interactive applications.
- **PANDAS:** An open-source library used for data manipulation and analysis. It provides data structures and functions to efficiently work with structured data, such as CSV files. It is widely used in data science and data analysis tasks.
- **CV2 (OPENCV):** OpenCV (Open Source Computer Vision Library) is a computer vision and machine learning software library. It provides various functions and algorithms for image and video processing, object detection, face recognition, and more. It is widely used in computer vision applications.
- **PIL (PYTHON IMAGING LIBRARY):** PIL is a library for opening, manipulating, and saving many different image file formats. It provides functions for basic image processing operations such as resizing, cropping, and converting between different color spaces.

FUNCTIONS:

- **OPEN_CAMERA():** This function is called recursively to continuously capture frames from the camera, detect faces and eyes in the frames, and display the processed frames in the tkinter GUI. It uses the cv2.VideoCapture class to access the camera and the cv2.CascadeClassifier class to detect faces and eyes. The CNN model is used for lie detection.
- **SHOW_QUESTION():** This function displays the next question from the "PHQ9.csv" file in the tkinter GUI. It updates the question label and option labels based on the question number.
- **UPDATE_SCORE():** This function is called when the user selects an option for a question. It updates the score based on the selected option and checks if all questions have been answered. If all questions have been answered, it calculates the depression score, displays it in a button, and disables further interaction. It also calculates a conclusion based on the depression score using the bayes() function.

Notes:

- **h5py:** The h5py package is a Pythonic interface to the HDF5 binary data format. HDF5 lets you store huge amounts of numerical data, and easily manipulate that data from NumPy. For example, you can slice into multi-terabyte datasets stored on disk, as if they were real NumPy arrays. Thousands of datasets can be stored in a single file, categorized and tagged however you want.

- **Keras**: Keras is a high-level, deep learning API developed by Google for implementing neural networks. It is written in Python and is used to make the implementation of neural networks easy. It also supports multiple backend neural network computation. Keras is relatively easy to learn and work with because it provides a python frontend with a high level of abstraction while having the option of multiple back-ends for computation purposes. This makes Keras slower than other deep learning frameworks, but extremely beginner-friendly.
- **Tensorflow**: TensorFlow is a free and open-source software library for machine learning and artificial intelligence. It can be used across a range of tasks but has a particular focus on training and inference of deep neural networks.