EMOTION DETECTOR

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- SUBMITTED TO:

  IOT ACADEMY

CANDIDATE'S DECALARATION

- I hereby declare that the project report titled “Emotion detector" is my original work. All references, ideas, and data used in this project report have been appropriately cited and acknowledged. The source of all the information and materials used in this project report has been clearly identified.
- The project was carried out under the guidance of Mr. Arihant Jain, IOT Academy, who provided me with valuable insights, feedback, and support throughout the project.
- I take full responsibility for any errors or omissions in the project report and hereby authorize the institute to use the report for academic purposes.

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ABOUT EMOTION DETECTION

Emotion detection, also known as emotion recognition, is a field of study that deals with using technology to identify a person's emotions. This can be done through a variety of methods, including:

Facial expressions: This is the most common method of emotion detection. Cameras can be used to track a person's facial movements, and algorithms can be used to analyze these movements and identify emotions such as happiness, sadness, anger, and surprise.

Speech patterns: The way a person speaks can also reveal their emotions. Emotion detection systems can analyze things like a person's tone of voice, pitch, and speaking rate to identify their emotional state.

Text analysis: It's possible to analyze written text to detect emotions. This can be done by looking for certain words and phrases that are associated with particular emotions.

Physiological signals: Wearable devices can be used to track physiological signals such as heart rate, skin temperature, and blood pressure. These signals can be used to infer a person's emotional state.

ABOUT THE DATASET

The dataset contains 35,685 examples of 48x48 pixel gray scale images of faces divided into train and test dataset. Images are categorized based on the emotion shown in the facial expressions (happiness, neutral, sadness, anger, surprise, disgust, fear).

SOFTWARE:
JUPTER NOTEBOOK OR GOOGLE COLAB

- Jupyter Notebook is an open-source web application widely used in data science, research, and education. It provides an interactive environment for writing and executing code in various programming languages, with Python being the most popular choice. Users can seamlessly combine code, explanatory text, visualizations, and multimedia content in a single document, making it an excellent tool for documenting and sharing data analysis and research findings. Its support for Markdown enables text formatting, while integration with data visualization libraries simplifies the creation of charts and plots.

- Google Colab, short for Colaboratory, is a free cloud-based platform from Google that lets you write and run Python code in a Jupyter Notebook environment, all collaboratively. Unlike most personal computers, Colab offers free access to powerful computing resources like GPUs and TPUs. This makes it ideal for running computationally intensive tasks like training machine learning models

ABOUT CNN

CNN stands for Convolutional Neural Network. It's a type of artificial intelligence particularly good at recognizing patterns in images. Here's a breakdown of what CNNs are and what they do:

Function: CNNs excel at image recognition and processing tasks. They are inspired by the structure of the human visual cortex and can extract features from images at various scales.

Applications: CNNs are widely used in computer vision tasks like facial recognition, medical image analysis, and self-driving cars.

Architecture: CNNs have a layered structure including convolutional layers, pooling layers, and fully connected layers. Convolutional layers use filters to extract features from the input image, pooling layers reduce the image's size while retaining important information, and fully connected layers process the extracted features for classification or other tasks.

APPROACH

The Convolutional Neural Network (CNN) workflow typically begins by importing necessary libraries. Then, data preprocessing cleans and prepares the images for the model. This may involve resizing, normalization, or other adjustments. Next, the data is split into training, validation, and testing sets. An Image Data Generator can be used to artificially augment the training data to improve model robustness. After this setup, the CNN model architecture is defined, specifying layers like convolution and pooling for feature extraction, and fully connected layers for classification. The model is then trained on the training data, iteratively optimizing its internal parameters based on the validation set's performance. Once trained, the model's accuracy is evaluated on the unseen testing set. Predictions can be made on new data. Finally, the trained model can be saved for later use and loaded to make predictions on new data.

ACCURACY IN TRAINING AND TESTING

	TRAINING	TESTING
ACCURACY	0.9	0.6

BIBLIOGRAPHY

Dataset: Kaggle- https://www.kaggle.com/datasets/ananthu017/emotion-detection-fer

THANK YOU