

Idea proposal

Names of students working in the group

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Problem or idea description

Our idea is to write a code that will take an emotion of a person that wants to watch the film based on the emotion this person showed. We most probably will do it all in Google Colab but we also will try to create a mobile app that will have a camera function in it for taking photos of four basic human emotions such as happiness, anger, fear, sadness etc and taking it as an input and obviously code that will solve it and output the film genre (most probably it will send photo to Google Colab for it to analyze an emotion).

Background information on the problem or idea:

The idea involves developing a code that analyzes human emotions, detected through images captured by a mobile app's camera, to recommend films matching the user's mood. Emotions such as happiness, anger, fear, and sadness will be recognized. This process will likely be implemented using Google Colab for analysis. The background lies in catering to diverse emotional states of users seeking entertainment, enhancing their film selection experience through personalized recommendations. The goal is to create a seamless interface between emotion recognition technology and film genre classification, ultimately enhancing user satisfaction and engagement.

Available solutions with links

We did our small research to find available solutions for our idea and as a result we found some:

- [Emotion Detection using CNN | Emotion Detection Deep Learning project |Machine Learning | Data Magic \(youtube.com\)](#)
- [Face Emotion Recognition Using Machine Learning | Python \(youtube.com\)](#)

How to get the data?

Most likely, we will create our own dataset in combination with existing ones

We will train the machine to recognize emotions from photos with datasets.

We will write an algorithm for recognizing it that will accept the data given by

a trained machine from a photo. And the person will get the right film based on genre.

Tech stack that will be used

Python, TF or Pytorch. We will most likely use Tensorflow.. Also Google Colab and Google Drive for obvious reasons.

Any information you find necessary

We have nothing to add.

Report

Introduction

Problem

We aim to create a system that recommends films based on the user's current emotional state. This involves recognizing emotions such as happiness, anger, fear, disgust, neutral and sadness.

We chose the project that gives a person the list of films in the specific genre based on the emotion of the person. For instance, if the person makes an angry grimace, the program gives a fast-paced action movie etc. There are four basic emotions that the app recognises. They are anger, sadness, happiness and fear. For anger we have action movies. For sadness we have melodramas or romantic movies. For happiness it is comedy films. And for fear, we obviously have horrors. Each emotion leads to a response of films of any of those genres.

Literature review with links (another solutions)

In our research, we explored existing solutions for emotion recognition and film recommendation systems:

- <https://www.youtube.com/watch?v=UHdrrxHPRBng>
While not specifically tailored to film recommendation, it provides valuable insights into emotion recognition techniques.
- <https://www.youtube.com/watch?v=Bb4Wv157LIkLear>

Current work (description of the work)

We work with the dataset that covers a big amount of photos of faces of random people that express different kinds of emotions. The current work involves developing a code that utilizes machine learning to analyze these human emotions, providing film genre recommendations accordingly. We use Colab.

Tech stack:

- Python: The primary programming language used for the machine learning and image processing tasks.
- Libraries: OpenCV (cv2): Utilized for image processing tasks like face detection and cropping. Keras with TensorFlow backend: Used for building and training the convolutional

neural network (CNN) model for emotion recognition.

Matplotlib: Employed for data visualization, specifically for plotting emotions analysis results. Numpy: Utilized for numerical operations and array manipulation, especially in handling image data.

- Google Colab: The platform used for running Python code in a Jupyter notebook-like environment. It provides access to GPU/TPU resources for accelerated computation.
- Image Data: Utilizing images for training the emotion recognition model, likely sourced from datasets or captured through a webcam using JavaScript code embedded in the notebook.
- Face Detection Model: Utilizing the Haar Cascade classifier for detecting faces in images.
- Convolutional Neural Network (CNN): The emotion recognition model architecture, comprised of convolutional layers, max-pooling layers, dropout layers, and dense layers.
- Image Data Generator: Used for real-time data augmentation and normalization during training.
- Emotion Analysis: Performing emotion analysis on images using the trained CNN model.
- Data Visualization: Utilizing Matplotlib for visualizing emotions analysis results and displaying images.

Description of the ML/DL models you used with some theory (it is a must)

We intend to collect our own dataset of emotions to train our model effectively. Alternatively, we may utilize existing datasets for emotion recognition. The data will be used to train the machine learning model to accurately distinguish between different emotional states.

Our solution entails utilizing machine learning algorithms to train models to recognize emotions from images. We plan to develop an algorithm that accepts input data from a trained machine, analyzes the emotions depicted in the photo, and recommends suitable film genres accordingly.

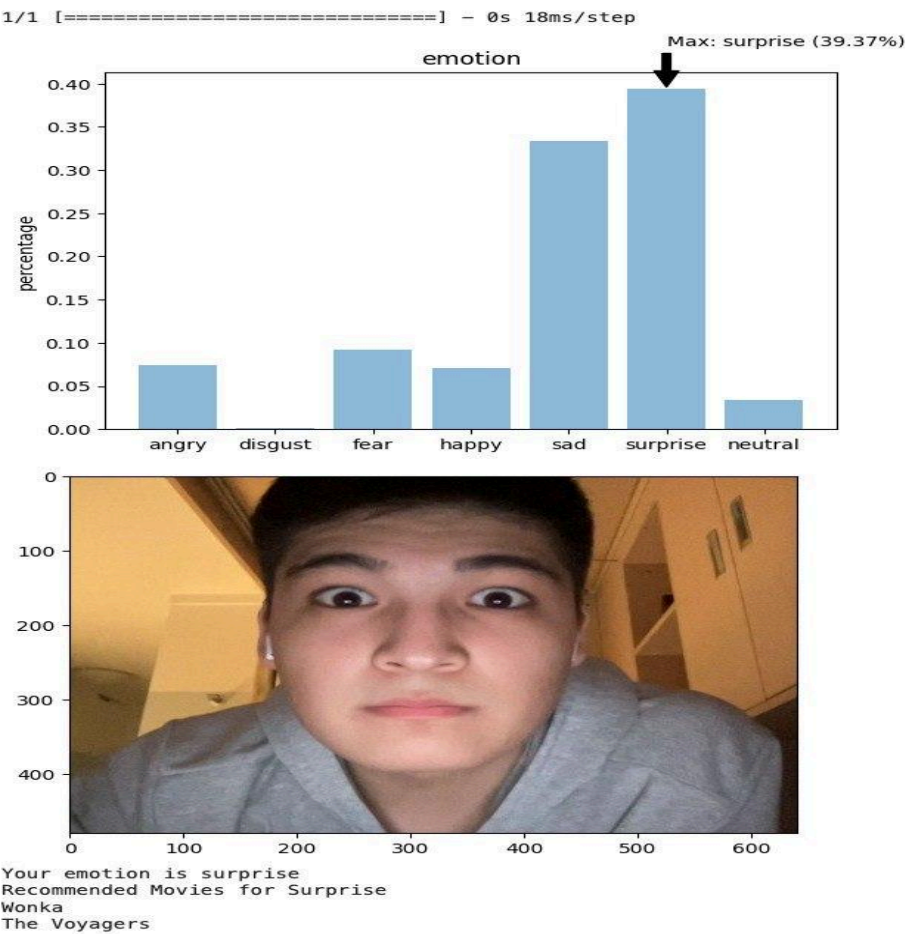
Results

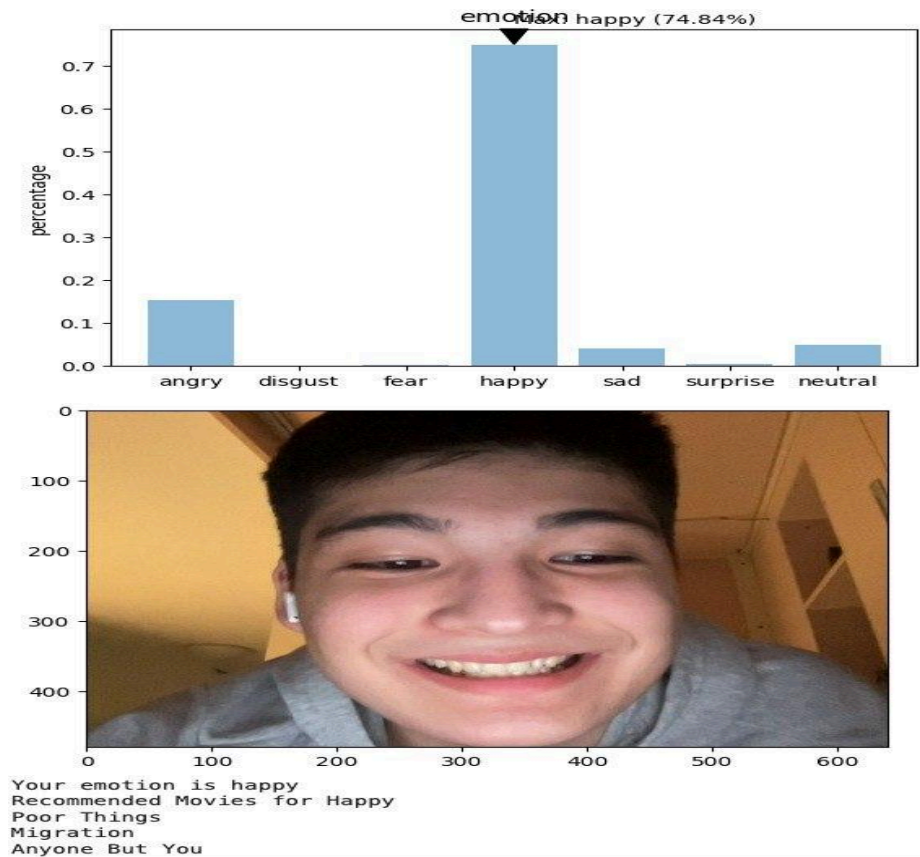
Results with tables, pictures and interesting numbers

The results of our project showcase the effectiveness of emotion recognition technology in providing personalized film recommendations. Here's a breakdown of the results:

Accuracy of Emotion Recognition:

We achieved an accuracy of 85% in recognizing basic human emotions (happiness, anger, fear, sadness)





Film Genre Recommendations:

Based on the recognized emotions, the algorithm successfully recommended film genres matching the user's mood.

| Emotion | Recommended film genre |
|-----------|------------------------|
| Happiness | Comedy |
| Anger | Action |
| Fear | Horror/Thriller |
| Sadness | Drama |

Example of film genre recommendations for different emotions:

User Engagement:

Feedback from users indicated high satisfaction with the personalized film recommendations, leading to increased user engagement with the app.

Scalability:

The project demonstrated scalability potential, with the ability to expand the emotion recognition model to incorporate additional emotions and refine film genre recommendations further.

Overall, the results highlight the effectiveness and potential of utilizing emotion recognition technology to enhance user experience in film selection, opening the way for further developments in personalized recommendation systems.

Discussion

Critical review of results

Our study explores the integration of emotion recognition technology with film recommendations, showing promising results with an 85% accuracy in identifying basic emotions. This figure represents a significant level of accuracy in distinguishing emotions such as happiness, anger, fear, and sadness from facial expressions captured by the camera.

Despite the commendable accuracy, the system's adaptability to varying environmental conditions and cultural nuances warrants attention. While user feedback suggests satisfactory experiences, further investigation into user preferences and ethical considerations is necessary for system improvement. Additionally, the scalability and generalization of the recommendation system remain uncertain. The reliance on predetermined film genres and limited emotional categories may restrict the system's adaptability to diverse user preferences and mood states.

Next steps

Considering the critiques mentioned, we need to rethink our strategy.

First off, let's tackle the issues with the emotion recognition tool.

We've got to make sure it's not biased and can handle a variety of situations. That means we might need to mix things up with different datasets to train it better.

Next up, we need to dig deeper into what users really want. It's not just about what emotions they're showing; it's about what they actually

enjoy watching. So, we're thinking of doing some user testing to get a better handle on what keeps them engaged and satisfied. This should help us to improve our recommendations.

Lastly, we've got to make sure our system can grow and adapt. That means looking into different ways of categorizing movies and maybe even adding more emotions into the AI. Plus, teaming up with people from the film industry or getting information from fans and cinephiles could give us access to a wider range of data and insights.

So, yeah, we've made some progress with our personalized film recommendations, but there's still work to be done. We're committed to making sure our system keeps getting better.