

✓ FACIAL ATTRIBUTE ANALYSIS

This utilizes the DeepFace library to analyze facial attributes such as emotion, age, gender, and race from images. By leveraging pre-trained deep learning models, the project aims to demonstrate how computer vision techniques can be applied to extract meaningful insights from facial images. The analysis involves loading images, resizing them for model compatibility, and running the analysis while considering system resource constraints to ensure efficient execution.

Facial analysis is a rapidly evolving area in artificial intelligence and computer vision, with applications in various fields such as security, marketing, healthcare, and social media. The DeepFace library simplifies the implementation of complex neural networks for facial attribute recognition by providing an easy-to-use interface.

1- Load an Image: We use OpenCV to read an image from the local filesystem

2- Preprocess the Image: Resizing the image to the required dimensions ensures compatibility with the model while reducing memory usage.

3- Analyze Facial Attributes: The DeepFace library is employed to extract various attributes from the image. The analysis results are returned in a structured format, providing insights into the detected emotions, estimated age, gender, and race.

4- Handle Resource Constraints: Strategies such as limiting the number of attributes analyzed and optimizing image size are implemented to prevent memory overflow errors.

```
import cv2
```

```
img = cv2.imread("/content/kid.jpeg")
```

```
import matplotlib.pyplot as plt
```

```
plt.imshow(img)
```

```
<matplotlib.image.AxesImage at 0x7f00e430d210>
```




```
plt.imshow(cv2.cvtColor(img, cv2.COLOR_BGR2RGB))
```

 <matplotlib.image.AxesImage at 0x7f00d64bd240>



!pip install deepface

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```
from deepface import DeepFace
pred=DeepFace.analyze(img)
```

```
➡ Action: race: 100%|██████████| 4/4 [00:03<00:00, 1.23it/s]
```

```
pred
```

```
➡ [{ 'emotion': { 'angry': 0.04123231428420522,
  'disgust': 1.0098943046415173e-09,
  'fear': 3.441458530252155,
  'happy': 0.055676127433269926,
  'sad': 2.26107324527821,
  'surprise': 93.59629230543467,
  'neutral': 0.6042609667913953},
  'dominant_emotion': 'surprise',
  'region': { 'x': 106,
  'y': 28,
  'w': 61,
  'h': 61,
  'left_eye': None,
  'right_eye': None},
  'face_confidence': 0.92,
  'age': 15,
  'gender': { 'Woman': 81.50049448013306, 'Man': 18.4995099902153},
  'dominant_gender': 'Woman',
  'race': { 'asian': 1.9876522943377495,
  'indian': 5.304407328367233,
  'black': 0.480898842215538,
  'white': 45.644885301589966,
  'middle eastern': 21.39214426279068,
  'latino hispanic': 25.190013647079468},
  'dominant_race': 'white' }]
```

```
pred[0]['dominant_emotion']
```

```
➡ 'surprise'
```

```
prediction=pred[0]
prediction['dominant_emotion']
```

```
➡ 'surprise'
```

The project successfully demonstrates the capabilities of the DeepFace library in facial attribute analysis, highlighting the potential of deep learning in extracting meaningful information from images. This technology opens up numerous possibilities for applications in diverse sectors. Future enhancements could include integrating real-time video analysis, refining the accuracy of predictions, and expanding the model to include more attributes. By continuing to explore these advancements, we can further harness the power of artificial intelligence in understanding human emotions and demographics.