



IIT-Delhi-Artificial Intelligence and Machine Learning For Industry- Batch02

Face Recognition System

Project By:

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Overview:

Face recognition:

It is a technology that can identify or verify a person by analyzing and comparing patterns based on the person's facial features. It works by capturing an image of a face, then measuring various aspects of the face—such as the distance between the eyes, the shape of the nose, or the contour of the jawline.

Training and testing dataset:

LFW is a widely used benchmark dataset for face recognition and verification tasks. It contains over 13,000 images of faces, each labeled with the identity of the person in the image. These images were collected from the web, ensuring a diverse set of conditions and appearances. *Ref: <https://vis-www.cs.umass.edu/lfw/index.html>*



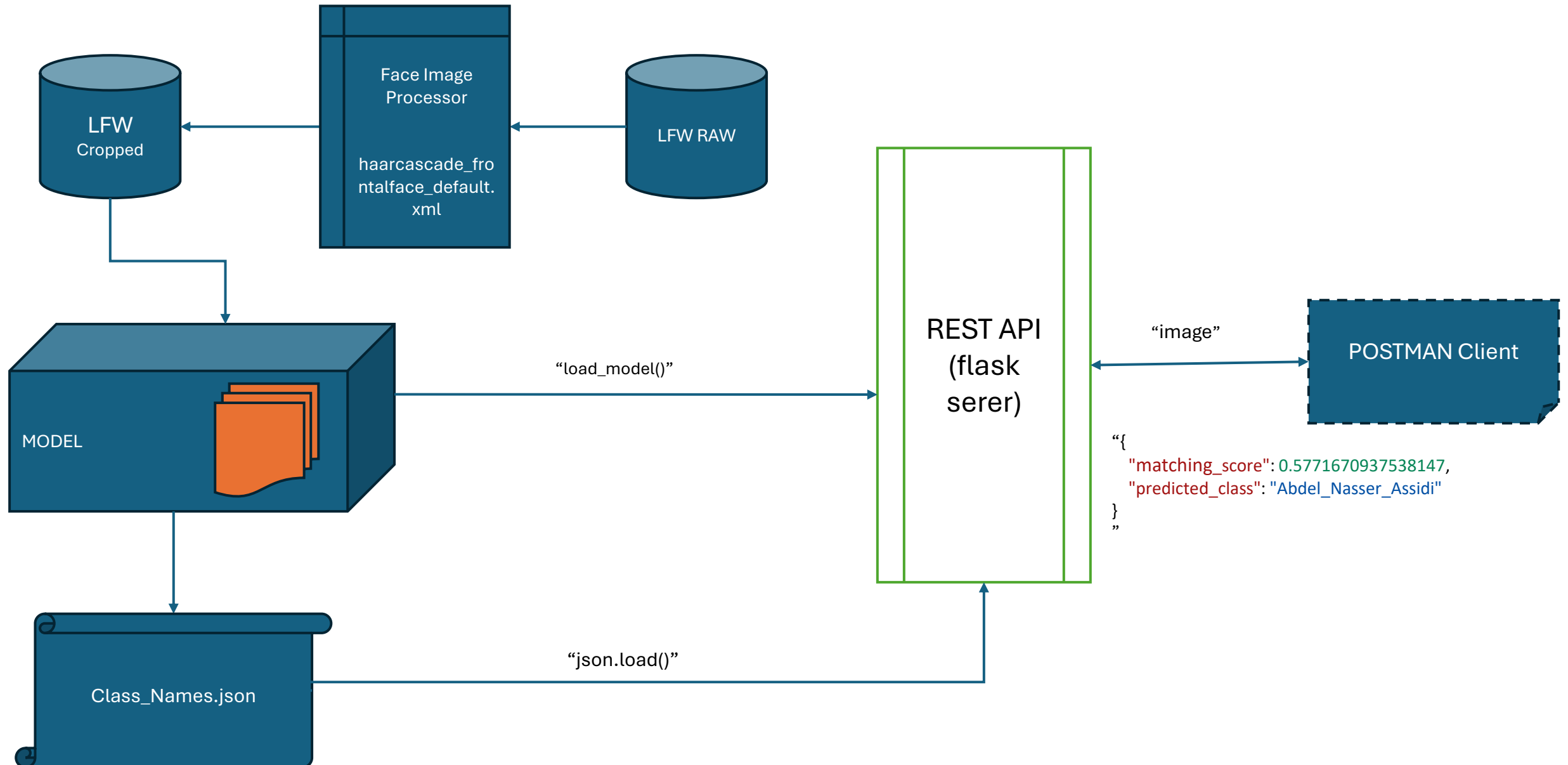
Tools Used:

- TensorFlow for model creation.
- Flask for building the REST API.
- Postman for testing the API.
- Numpy, CV2 for numerical operations and image processing.
- OS, Json, sklearn

Project Flow:

- Data Preparation using Labeled Faces in the Wild. *Ref: <https://vis-www.cs.umass.edu/lfw/>*
- Model Training
- REST API Development
- API Testing using Postman

Design:



Model Creation

Data Preparation:

- Used cropped face images for training.
- Images were resized and normalized.


Model Architecture:




- Convolutional Neural Network (CNN) with multiple Conv2D and MaxPooling layers.
- Softmax activation for classification.


•Training Process:

- 40 epochs, accuracy improvements over epochs.
- Challenges faced: Limited data, overfitting issues.


Sample API Testing with Postman:



 FRS_API / b

 Save   Share





POST 

127.0.0.1:5000/predict?file



Send 


Params  Authorization Headers (7) Body  Scripts Settings Cookies


☐ none ☒ form-data ☐ x-www-form-urlencoded ☐ raw ☐ binary ☐ GraphQL



	Key		Value	Description	...	Bulk Edit
<input checked="" type="checkbox"/>	image	File 	 Abdel_Nasser_Assidi_0001.png 			
	Key	Text 	Value	Description		

Body Cookies Headers (5) Test Results

 Status: 200 OK Time: 124 ms Size: 242 B  Save as example ...

Pretty Raw Preview Visualize JSON 



```
1 {
2   "matching_score": 0.960220456123352,
3   "predicted_class": "Abdel_Nasser_Assidi"
4 }
```

Future Work:

- Improve model accuracy.
- Optimize API response time.
- Large dataset for training.

Use Case:

- Public place surveillance system like schools, colleges, government offices
- Forensic department police use case for riots, rally's, festivals etc

Thank you ...