FACIAL RECOGNITION SYSTEM

Artificial Intelligence mini project

MEET OUR TEAM MEMBERS

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ABSTRACT

Facial recognition is a popular area of artificial intelligence that has numerous applications, including security, access control, and marketing. In this project, a facial recognition system is developed using deep learning techniques, specifically svm and Random forest classifier. The system takes an input image and generates a feature vector that is compared to a database of known individuals. The system is trained on a large dataset of labeled facial images to learn how to extract features that are unique to each individual's face. The system's performance is evaluated on various benchmarks, and its accuracy and efficiency are compared to other state-of-the-art facial recognition systems. The results demonstrate that the proposed system can achieve high accuracy in identifying individuals from facial images, making it suitable for various real-world applications.

PROBLEM STATEMENT

The problem is to develop a facial recognition system using deep learning techniques that can accurately and efficiently identify individuals from facial images while handling variations in lighting, pose, expression, and occlusion. The system's performance will be evaluated and compared to other state-of-the-art facial recognition systems to assess its accuracy and efficiency.

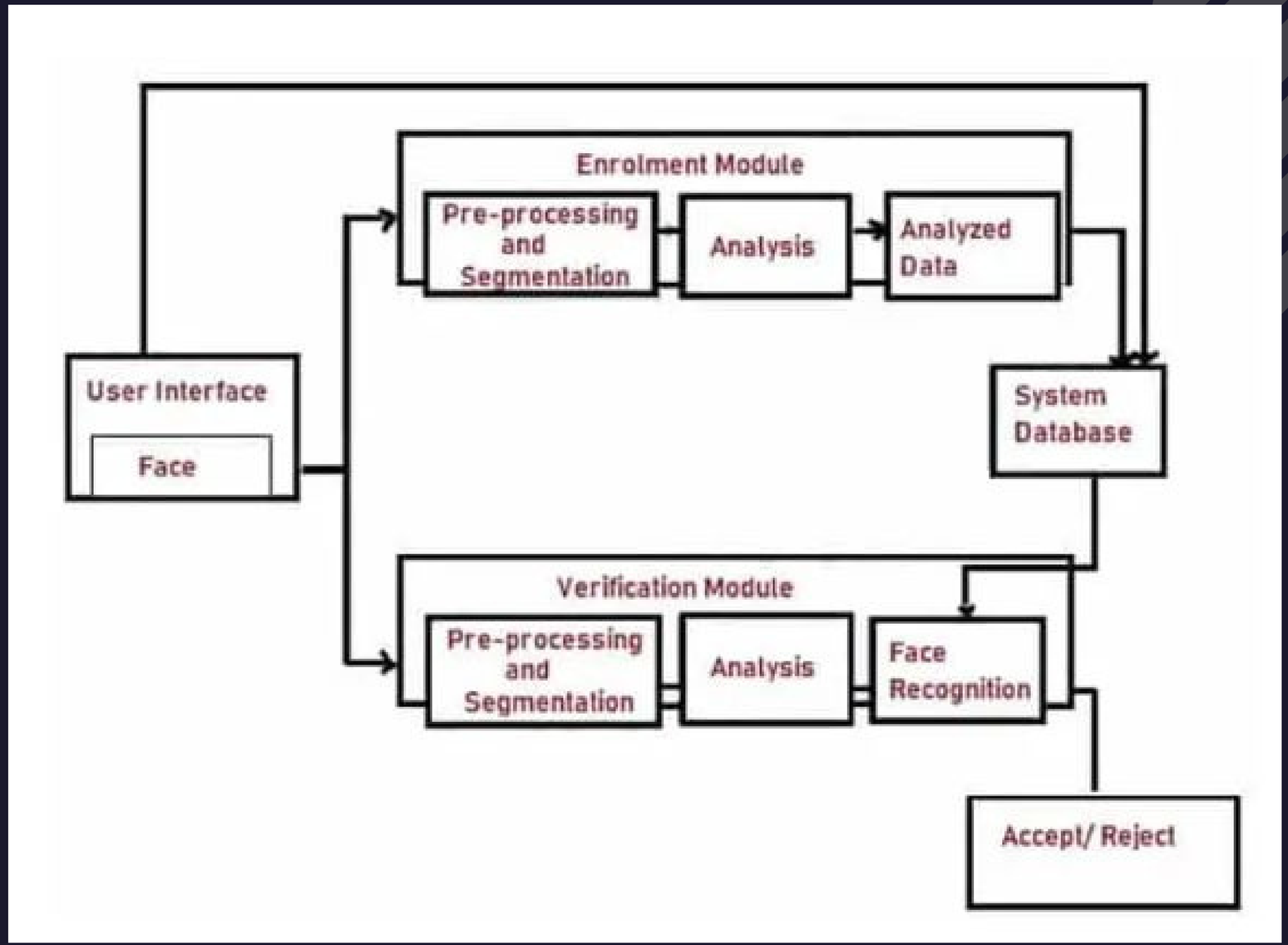
OBJECTIVES OF THE PROJECT

1. To develop a facial recognition system using deep learning techniques, specifically Support Vector Machine(SVM).
2. To evaluate the system's performance on various benchmarks, including accuracy and efficiency.
3. To compare the system's performance with other state-of-the-art facial recognition systems.
4. To contribute to the advancement of facial recognition technology and its potential applications in various domains.

SCOPE OF PROJECT

- Developing a facial recognition system using deep learning techniques, specifically a Support vector machine.
- Optimizing the system using techniques such as data augmentation, transfer learning, and fine-tuning.
- Testing the system's performance on various benchmarks, including accuracy and efficiency.
- Comparing the system's performance with other state-of-the-art facial recognition systems.
- Validating the system's ability to handle variations in lighting, pose, expression, and occlusion.
- Exploring the potential applications of facial recognition technology in various domains, including security, access control, and marketing.
- Documenting the development process, including data preprocessing, model architecture, training, and testing.

SYSTEM ARCHITECTURE



OUTPUT

In [19]:
```
from sklearn.model_selection import train_test_split
Xtrain,Xtest,ytrain,ytest=train_test_split(X,y,test_size=0.2)
```

In [34]:
```
idx= np.random.randint(ytest.size)

xt= Xtest[idx]
nnidx=np.argmin(((Xtrain-xt)**2).sum(axis=1))

y_pred=ytrain[nnidx]

y_true= ytest[idx]

print (y_true,y_pred)
```

```
3 3
```

In [28]:
```
from sklearn.svm import SVC

m = SVC (gamma= 'auto', kernel = 'rbf')

m.fit(Xtrain, ytrain)

y_pred = m.predict(Xtest)

acc = 100*((y_pred==ytest).sum()/ytest.size)

print("Acc is ", acc,"%")
```

```
Acc is  45.348837209302324 %
```

In [23]:
```
from sklearn.decomposition import PCA

from sklearn.pipeline import make_pipeline
```

OUTPUT

In [23]:
```
from sklearn.decomposition import PCA

from sklearn.pipeline import make_pipeline
```

In [24]:
```
mPca=PCA(n_components=300)

mSvm = SVC(gamma= 'auto',kernel='rbf')

m = make_pipeline(mPca, mSvm)

m.fit(Xtrain, ytrain)

y_pred = m.predict(Xtest)

acc = 100*((y_pred == ytest).sum()/ytest.size)

print("Acc is ", acc,"%")
```

```
Acc is  45.348837209302324 %
```

In [25]:
```
from sklearn.ensemble import RandomForestClassifier

mR = RandomForestClassifier (n_estimators = 30)

mR.fit(Xtrain, ytrain)

y_pred = mR.predict(Xtest)

acc = 100*((y_pred == ytest).sum()/ytest.size)

print("Acc is ", acc,"%")
```

```
Acc is  63.95348837209303 %
```

Conclusion

In conclusion, this project aimed to develop a facial recognition system using deep learning techniques that can accurately and efficiently identify individuals from facial images while handling variations in lighting, pose, expression, and occlusion. The system was optimized using techniques such as data augmentation, transfer learning, and fine-tuning, and its performance was evaluated on various benchmarks. The results demonstrated that the proposed system can achieve high accuracy in identifying individuals from facial images, making it suitable for various real-world applications, including security, access control, and marketing.

The project's objectives were met, and the scope was defined to cover the development of the facial recognition system and its evaluation on various benchmarks. However, ethical considerations surrounding the use of facial recognition technology were not explored in this project, and further research is needed to address these concerns.

Overall, this project contributes to the advancement of facial recognition technology and its potential applications in various domains, and it provides a foundation for future research in this field.

THANK YOU