

DASC 5309 CAPSTONE SP24 Group 27

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Project Description:

An innovative security solution called the Facial Recognition System for Smart Access Control is made to improve access control policies in various settings. This project focuses on accurately recognizing and verifying individuals based on their facial features by utilizing the potential of computer vision and machine learning techniques. Office buildings, apartment complexes, and other secure environments can use the system because it offers a smooth and secure access experience.

How and from where we are planning to get our data:

A face recognition project requires careful planning, ethical concerns, and compliance to privacy standards when gathering data. We are planning to use publicly accessible, ethically sourced datasets such as

[UCI-ML](#), [GitHub](#), [Kaggle](#), [Data.gov](#), [Eurostat](#)

These are frequently accompanied by appropriate licensing agreements when gathering data for this project.

Questions to address and corresponding statistical learning methods:

What is the accuracy and efficiency comparison between various face recognition models?

Statistical Learning Method: Model Comparison and Evaluation Metrics (e.g., Accuracy, Precision, Recall, F1 Score)

What is the system's effectiveness in real-time applications?

Statistical Learning Method: Real-time Processing Optimization

Can we recognize specific individuals in a dataset with accuracy?

Statistical Learning Method: Utilizing Face Recognition Models for Statistical Learning (CNN)

To what extent can the system adapt to changing lighting situations?

Statistical Learning Method: Data Augmentation, Histogram Equalization, Low-Light Image Enhancement, and Image Preprocessing Techniques

Can age and gender differences be handled by the facial recognition system?

Statistical Learning Method: Ensemble Models, Adaptive Learning and Age and Gender Prediction Model