Integrated Student System
Code Report

Made by: -

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Overview

The Integrated Student System is a Python GUI application that combines face recognition and grade prediction. It allows a user to:

1. Recognize a student from an image using facial recognition.
2. Select a subject and student to predict their next grade based on previous performance.
3. Visualize the prediction and hear the result through text-to-speech.

Imported Libraries

- face_recognition: Face detection and recognition
- os, cv2, numpy: File handling, image processing, and numerical computation
- tkinter: GUI elements and dialogs
- PIL: For displaying images in the GUI
- Pandas: For handling student data from Excel
- matplotlib.pyplot: For grade prediction visualization
- sklearn.linear_model.LinearRegression: ML model for predicting grades
- pyttsx3: Text-to-speech output

Class: StudentSystem

Handles the application logic.

__init__: Initializes GUI and calls data loading methods

Components:

- Face recognition upload
- Prediction controls (dropdowns)
- Output labels

Load known faces

Loads student images from 'known_faces', extracts encodings, and stores names. If the folder doesn't exist, creates it.

Load student data

Reads 'students.xlsx' file, extracts unique subjects and students for dropdown menus.

upload image

Opens file dialog, extracts face encoding, compares with known faces, and displays match result.

predict grade

Filters data for the selected student and subject. Uses Linear Regression to predict the next grade. Displays result in text, chart, and speech. Shows errors if selection is invalid or data is missing.

run

Launches the Tkinter GUI.

if __name__== '__main__'

Ensures the application runs only when executed directly. Initializes and runs the GUI.

Example Excel Format

Expected columns in students.xlsx:

Student Name | Subject | Grade

Summary

- Face Recognition: Identifies students from images
- Grade Prediction: Uses Linear Regression
- GUI: Dropdowns and buttons
- Text-to-Speech: Speaks results
- Plotting: Grade trends with prediction