Installation Guide for Face Recognition Project

This guide provides step-by-step instructions to install and set up the required components for running the face recognition project with three main Python scripts: 'face_capture.py', 'encode_faces.py', and 'main.py'.

Prerequisites

1. Ensure Python 3.10 is installed on your system. You can download Python from https://www.python.org/downloads/.
2. Install pip, the Python package installer, if not already installed. This is typically included with Python installations.
3. Clone or download the project files ('face_capture.py', 'encode_faces.py', 'main.py') into a directory on your computer.

Installing Dependencies

This project requires several libraries to be installed. Follow the steps below to install each one:

1. Open Command Prompt or PowerShell.

2. Navigate to the project directory where the Python files are located.

3. Run the following commands to install the required libraries:

pip install face_recognition

pip install opencv-python

pip install opencv-python-headless

pip install numpy

pip install pyzed-sl

Note: The 'pyzed-sl' library is specifically for ZED stereo cameras and requires the ZED SDK. Ensure you have the ZED SDK installed. You can download it from https://www.stereolabs.com/developers/.

Setting Up Each Script

1. face_capture.py

This script captures multiple face images of an individual using the ZED stereo camera and saves them in a directory with the person's name.

To run this script:
a. Open Command Prompt or PowerShell in the project directory.
b. Run the command: python face_capture.py
c. Enter the person's name when prompted.

d. The script will save multiple images in a folder under 'captured_faces' directory named after the person.

2. encode_faces.py

This script processes the captured face images and generates face encodings for future recognition.

To run this script:
a. Open Command Prompt or PowerShell in the project directory.
b. Run the command: python encode_faces.py
c. This will create a file named 'face_encodings.pkl' that stores the facial encodings.

3. main.py

This script performs face recognition with spoof detection using the ZED stereo camera.

To run this script:
a. Open Command Prompt or PowerShell in the project directory.
b. Run the command: python main.py
c. The camera feed will display with recognized faces. Press 'q' to exit the program.

Troubleshooting

1. If 'face_encodings.pkl' is not found, ensure you have run 'encode_faces.py' after capturing faces.
2. If the ZED camera is not recognized, check your ZED SDK installation and ensure the camera is properly connected.
3. For dependency issues, ensure each library is correctly installed by rerunning the pip install commands.

For further assistance, consult the documentation for each library or visit the ZED SDK developer page at https://www.stereolabs.com/developers/.

DISCLAIMER

This code is intended for educational and experimental purposes only.

The author(s) assume no liability for misuse or unintended outcomes of the code.

Please comply with local laws and obtain consent before capturing any face data.

Note that this system may not reliably detect spoofing attempts in all scenarios.