# Face Detection System

## Overview

This Face Detection System is a Python-based application that uses OpenCV to detect faces in real-time video streams. It provides a simple yet effective way to identify and count faces in a live camera feed, along with displaying the frames per second (FPS) for performance monitoring.

## Features

- Real-time face detection using OpenCV's Haar Cascade classifier

- Live FPS (Frames Per Second) calculation and display

- Face count display

- Interactive exit button within the video window

## Requirements

- Python 3.6+

- OpenCV (cv2)

- NumPy

## Installation

1. Ensure you have Python installed on your system. You can download it from [python.org](https://www.python.org/downloads/).

2. Clone this repository or download the `face\_detection\_system.py` file.

3. Install the required packages using pip:

```

pip install opencv-python numpy

```

## Usage

1. Navigate to the directory containing `face\_detection\_system.py`.

2. Run the script:

```

python face\_detection\_system.py

```

3. The application will open your default camera and start detecting faces.

4. The video window will display:

- Detected faces outlined with green rectangles

- Current FPS in the top-left corner

- Number of faces detected in the top-left corner

- An "Exit" button in the bottom-left corner

5. To exit the program, you can either:

- Click the "Exit" button in the video window

- Press 'q' on your keyboard

## Customization

You can modify the following aspects of the system:

- Face detection parameters: Adjust `scaleFactor`, `minNeighbors`, and `minSize` in the `detect\_faces()` function for different detection sensitivity.

- Colors and text: Modify the color values and font settings in the drawing functions to change the appearance of the overlay information.

## Troubleshooting

- If the camera doesn't open, ensure that it's not being used by another application.

- If face detection is not accurate, try adjusting the parameters in the `detect\_faces()` function.

## Contributing

Contributions to improve the Face Detection System are welcome. Please feel free to submit pull requests or open issues to suggest improvements or report bugs.

## License

This project is open-source and available under the MIT License.

## Acknowledgments

This project uses OpenCV's Haar Cascade classifier for face detection, which is based on the work of Paul Viola and Michael Jones.