Stop Sign Violation Detection System
User Manual

1. System Overview

This system detects whether vehicles stop at a stop sign using computer vision. If a car does not stop, the system uses Plate Recognizer API to extract the license plate number, then saves video evidence for review.

2. Installing Python

1. Download Python 3.13.3 from the following link:

    https://www.python.org/ftp/python/3.13.3/python-3.13.3-amd64.exe

2. Run the installer.

3. Make sure to check the box that says 'Add Python to PATH'.

4. Complete the installation and verify it in Command Prompt:

```
python --version
```

3. Installing FFmpeg

1. Download the essentials build of FFmpeg from:

    https://www.gyan.dev/ffmpeg/builds/ffmpeg-git-essentials.7z

2. Unzip the folder and rename it to:

```
ffmpeg
```

3. Move the renamed folder to your local disk (usually C:\).

4. Add FFmpeg to system environment variables:

    - Open Start menu, search for 'Environment Variables'

    - Click 'Environment Variables...'

    - Under 'System variables', highlight 'Path' and click 'Edit'

    - Click 'New' and type:

```
C:\ffmpeg\bin
```

    - Click OK on all open dialog boxes to apply changes

5. Test by opening Command Prompt and typing:

```
ffmpeg -version
```

4. Downloading and Setting Up the Project

1. Download and unzip the project from GitHub:

   https://github.com/EthanRAtkinson/Traffic-Violation-Detection-System/archive/refs/heads/main.zip

2. Unzip the project to a folder of your choice.

5. Adding Your Video Footage

1. Place any footage of stop sign interactions into the following folder:

```
Traffic-Violation-Detection-System-main/Footage
```

2. Ensure that the videos are in .mp4 format or compatible with FFmpeg.

6. Running the Program

1. Inside the project folder, locate the file named:

```
run
```

2. Double click on 'run' to launch the program.

3. The program will automatically:

   - Extract frames using FFmpeg

   - Analyze the vehicle's motion

   - Detect violations and send frames to Plate Recognizer

   - Save all evidence to a structured output folder

7. Understanding Output Folder Structure

After the program runs, evidence is saved in:

```
Evidence/
└── [License_Plate]_[Video_Index]/
    ├── Clips/
    └── Frames/
```

Each folder contains frames and video segments where the vehicle failed to stop.

8. Troubleshooting

- 'python' not recognized: Ensure Python is added to PATH.
- 'ffmpeg' not recognized: Double-check the environment variable path is set to C:\ffmpeg\bin.
- No plates detected: Try clearer footage or adjust the angle of recording.

9. FAQ / Notes

- You must be connected to the internet for Plate Recognizer to function.
- The system currently performs best in daylight. Night detection requires further enhancement.