VISVESVARAYA TECHNOLOGICAL UNIVERSITY

BELAGAVI

A Project Synopsis Report on

"Pedestrian Detection using OpenCV"

Submitted in partial fulfillment of the requirement for the award of the degree of

MASTER OF COMPUTER APPLICATIONS

Under

VISVESVARAYA TECHNOLOGICAL UNIVERSITY

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1. Introduction:

Python:

- Python is an interpreted, high-level and general-purpose programming language. It was created by Guido van Rossum and is mainly used for web development (server-side), software development, mathematics, system scripting.

OpenCv:

- OpenCV (Open Source Computer Vision Library) is an open source computer vision and machine learning software library. OpenCV was built to provide a common infrastructure for computer vision applications and to accelerate the use of machine perception in the commercial products. OpenCV-Python is a library of Python bindings designed to solve computer vision problems.

Pedestrian Detection:

- Pedestrian detection is the task of locating all instances of human beings present in an image or video, and it has been most widely accomplished by searching all locations in the image or video, at all possible scales, and comparing a small area at each location with known templates or patterns of people.

File Structure:

- File structure is the organization of data in secondary storage device in such a way that minimizes the access time and the storage space. It is a combination of representations for data in

files and of operations for accessing the data. A file structure allows application to read, write and modify data.

- **File system:**
  - A file system controls how data is stored and retrieved. Without a file system, data placed in a storage medium would be one large body of data with no way to tell where one block of data stops and next begins. By separating the data into blocks and giving each block a name, the data is easily divided and identified.

2. Aim:

- The main aim of Pedestrian detection is to detect the visible pedestrians in image or video and locating all instances of human beings present in an image, and it has been most widely accomplished by searching all locations in the image, at all possible scales, and comparing a small area at each location with known templates or patterns of people.

3. Software requirement and Hardware requirement:

- **Hardware Specification:**
  - **Processor** : Intel i3 or higher processor.
  - **Hard Disk** : 10 GB disk space.
  - **Input Devices** : Keyboard, mouse.
  - **RAM** : 8 GB.

- **Software Specification:**
  - **Language : ** Python.
  - **Platform : ** Windows 7/8/10.
  - **IDE : ** Python 3, Jupyter Notebook.

4. Modules:

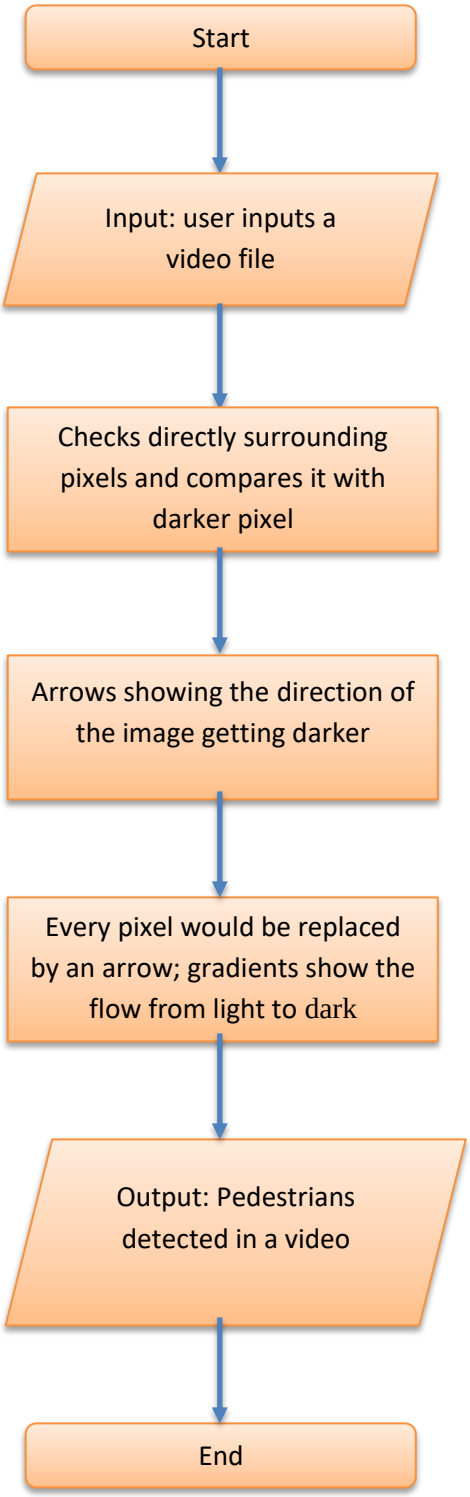
a) User Input:

- Here user needs to input a video file through the terminal by providing the suitable path of the video file. User can select his/her desired video from their system directories.

b) System Process:

- OpenCV has a built-in method to detect pedestrians. It has a pre-trained HOG (Histogram of Oriented Gradients) + Linear SVM model to detect pedestrians in images and video streams. This algorithm checks directly surrounding pixels of every single pixel. The goal is to check how darker is the current pixel compared to the surrounding pixels. The algorithm draws and arrows showing the direction of the image getting darker. It repeats the process for each and every pixel in the image. At last, every pixel would be replaced by an arrow, these arrows are called Gradients. These gradients show the flow of light from light to dark, thus detecting pedestrians.

5. Flowchart:


Start
Input: user inputs a video file
Checks directly surrounding pixels and compares it with darker pixel
Arrows showing the direction of the image getting darker
Every pixel would be replaced by an arrow; gradients show the flow from light to dark
Output: Pedestrians detected in a video
End