A
Report
On

Gender Classification Using Facial Images

Submitted in partial fulfillment for

Mini-Project Project III

Submitted by

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Declaration

I, hereby declare that the dissertation report entitled **"**Gender classification using facial images**"** submitted by me to **Walchand College of Engineering, Sangli** in fulfillment of the requirement for the award of the degree of **B. Tech** in **Information Technology** is a record of bonafide project work carried out by me under the guidance of **Prof. Dr. S. P. SONAVANE**

I further declare that the work reported in this project has not been submitted and will not be submitted, either in part or in full, for the award of any other degree or diploma in this institute or any other institute or university. I declare that this dissertation report reflects my thoughts about the subject in my own words. I have sufficiently cited and referenced the original sources, referred or considered in this work, fabricated, or falsified any idea/data/fact/source in data/fact/source in this my submission. I understand any violation of the above will be cause for disciplinary action by the Institute.

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CERTIFICATE

This is to certify that the project/mini-project/dissertation work entitled

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In partial fulfillment of the requirement for the degree of

Bachelor of Technology

in

INFORMATION TECHNOLOGY/COMPUTER SCIENCE AND INFORMATION TECHNOLOGY

From

Walchand College of Engineering, Sangli

(An Autonomous Institute)

Affiliated to Shivaji University, Kolhapur

This project/mini-project/dissertation work is a record of student's own work carried out by him under my supervision and guidance during the session 2022.

_____ _____

Guide HOD

_____

External Examiner

Table Of Contents:

1. Abstract:

Human Gender classification is one of the most interested and critical area of research. Research contains interactions between computers and human which includes vast information concerning difference in characteristics of males and females. In several kind of pattern recognition, machine learning gives a relation between gender and face. This paper proposes comparison between different techniques used for gender classification. Face is a unique biometric feature of the individual. Facial images with different combinations including frontal, aligned, smiling, non-smiling as well as expression images make the system complicated. Various face recognition methods such as Convolutional neural networks, Delaunay triangulations, geometry based methods like SVM (Support vector machine), LBP (Local Binary pattern).For human gender classification, SVM provides better accuracy as compared with existing methods.

2.Introduction and Related work

In era of Artificial intelligence, image processing and machine learning plays vital role. Over the period of time, gender classification has obtained wide importance. The aim of paper is to classify the human according to characteristic differences. The different areas of applications are identified where gender classification is important. Now a day, artificial intelligence for automated machines like robots are most important since it is essential for human. Human can classify gender easily but it is challenging task for automated machines. Our brain stores the details of object in terms of lines, edges or some patterns and remembers the same to find the information for classification. A security entrance can use gender information for surveillance and control to some area. . For example, female meeting is scheduled in conference hall and task is to allow only females to access the conference hall. It is spare application area which aid in restricted to one sex only. Another application of gender classification is in commercial area. An electronic billboard machine is the best example to display ads. Depending upon the gender detected at billboard, billboard machine choose the advertisement and display on flat panel cards. For effective service to individual, it is required to have more information about their sex. Hence task is to retrieve more accuracy when image quality is poor.

3.Problem statement:

- To implement Local Binary Pattern(LBP) for facial feature extraction.
- To implement Support Vector Machine(SVM) for classification into male and female.

4.Objectives:

1) To compare input image features with features of images of the Kaggle dataset.

2) To construct two dimensional array containing of pixel values of input image.

3) To classify gender based on feature like eye,eye brow,facial hair,nose.

5.Methodology:

Gender Classification is decomposed into two parts

1. Feature Extraction
2. Classification

Feature Extraction involves following steps:

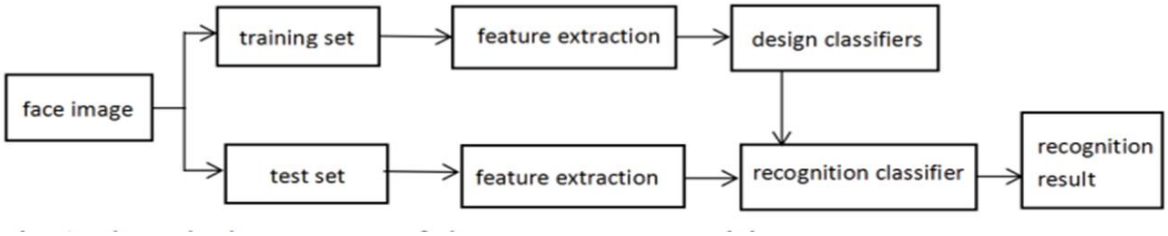
1. Convert input image into grayscale
2. Set pixel value as center pixel
3. Collect neighbourhood pixel(3x3 matrix)
4. Neighbourhood pixel value is 1 if it's value greater than center pixel otherwise 0
5. Replace center pixel value with resulted decimal value

Classification involves following steps:

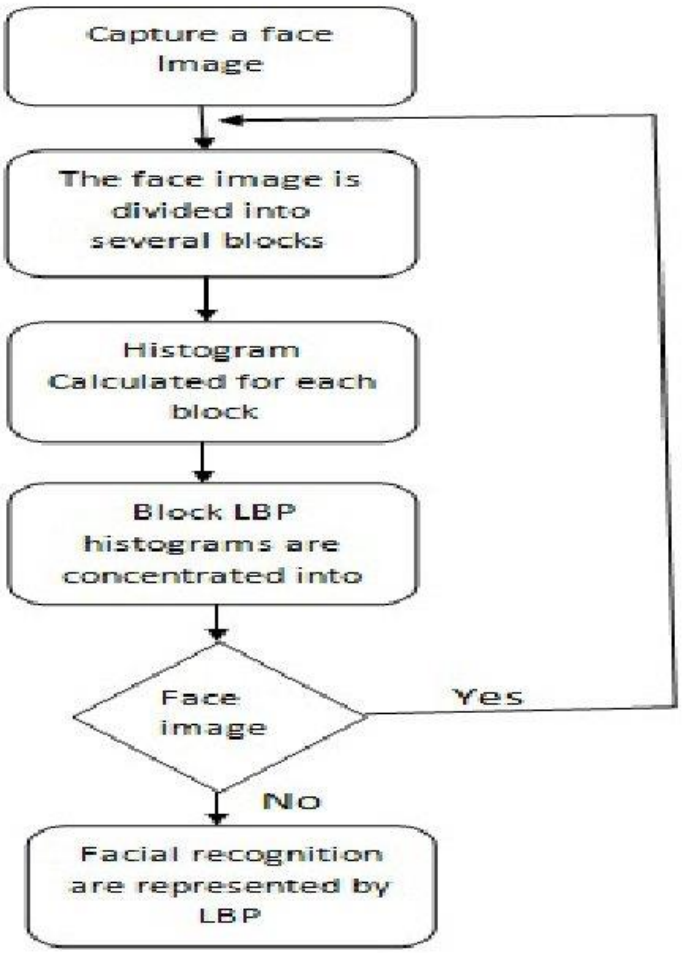
1. Import dataset
2. Explore the data to figure out
3. Divide the data into training and testing
4. Train the SVM algorithm
5. Evaluate the result of the algorithm

6.Project diagrams:

- **Program Flow:**



- **LBP Flowchart:**



7. Technology Used:

Pycharm:

PyCharm is an **Integrated Development Environment** (IDE) used for programming in Python. It provides code analysis, a graphical debugger, an integrated unit tester, integration with version control systems (VCSes), and supports web development with Django. PyCharm is developed by the Czech company JetBrains.

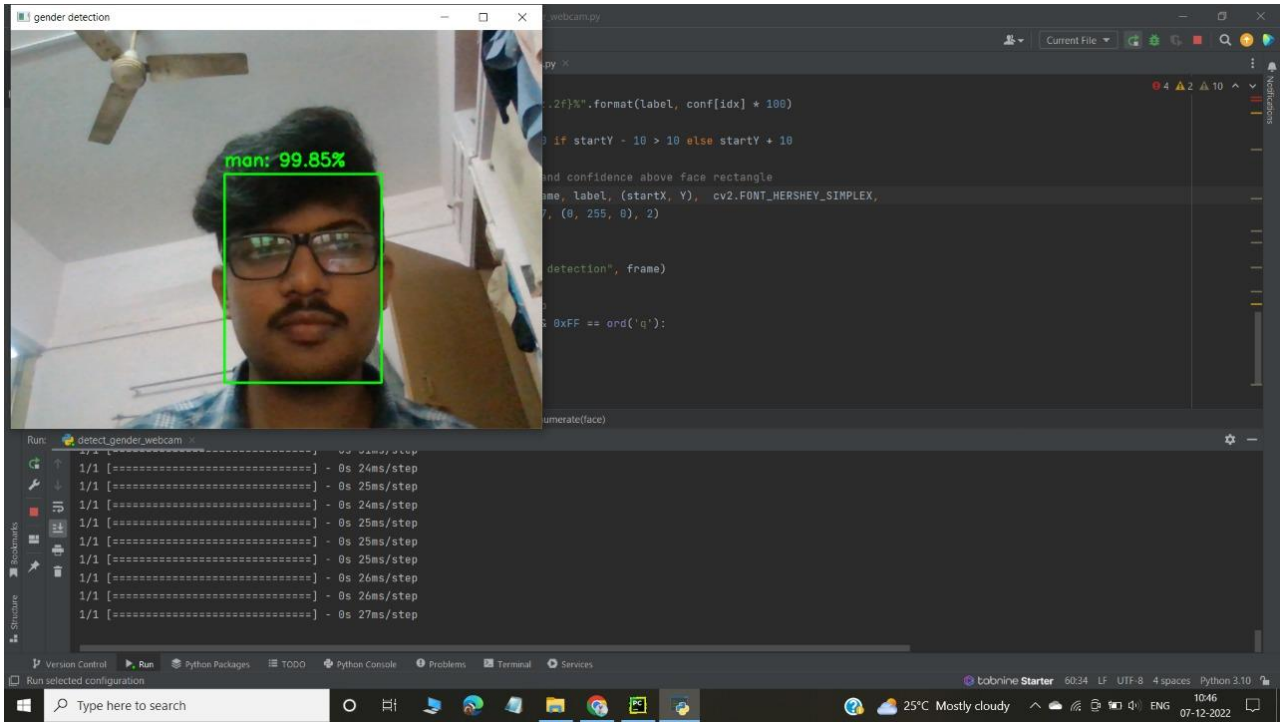
Github:

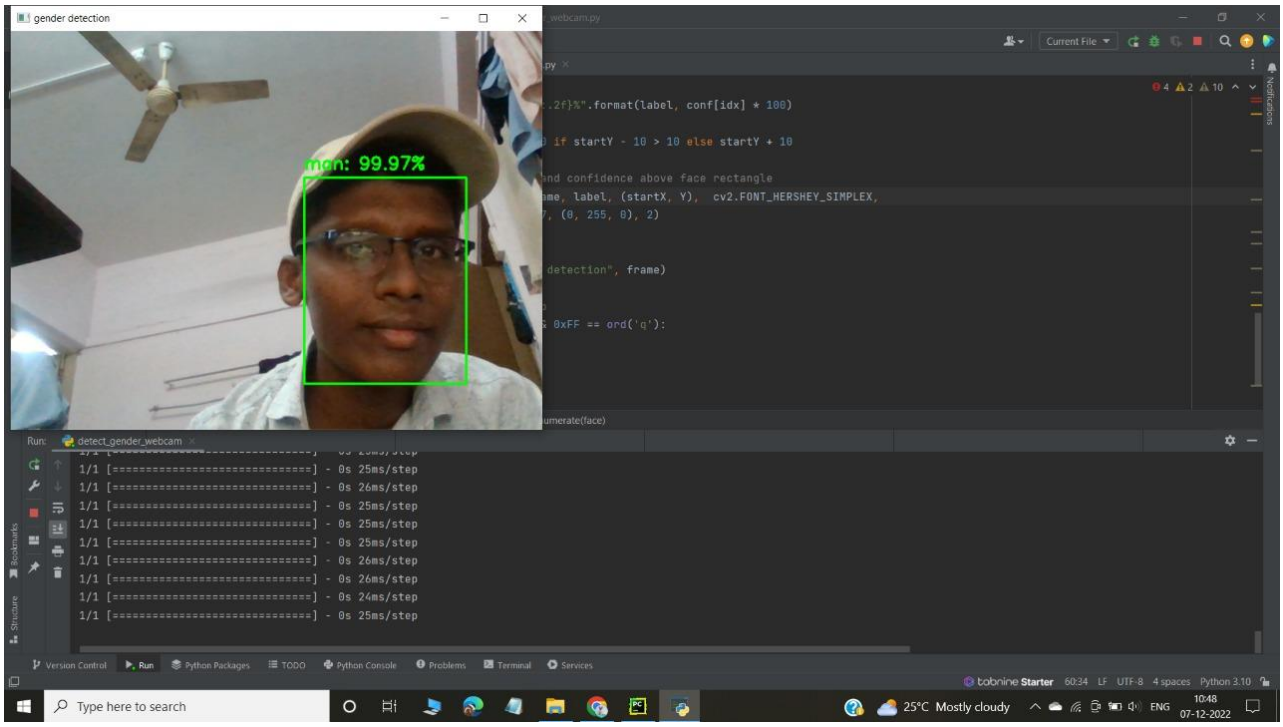
GitHub, Inc. is **an Internet hosting service for software development and version control using Git.** It provides the distributed version control of Git plus access control, bug tracking, software feature requests, task management, continuous integration, and wikis for every project.

Python:

Python is a high-level, general-purpose programming language. Its design philosophy emphasizes code readability with the use of significant indentation. Python is dynamically-typed and garbage-collected. It supports multiple programming paradigms, including structured (particularly procedural), object-oriented and functional programming. It is often described as a "batteries included" language due to its comprehensive standard library.

9)Results and Conclusion:




gender detection
man: 99.97%
.webcam.py
Current File
.2f}%".format(label, conf[idx] * 100)
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nd confidence above face rectangle
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, (0, 255, 0), 2)
detection", frame)
0xFF == ord('q'):
umerate(face)
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1/1 [==============================] - 0s 25ms/step
1/1 [==============================] - 0s 26ms/step
1/1 [==============================] - 0s 25ms/step
1/1 [==============================] - 0s 25ms/step
1/1 [==============================] - 0s 25ms/step
1/1 [==============================] - 0s 26ms/step
1/1 [==============================] - 0s 26ms/step
1/1 [==============================] - 0s 24ms/step
1/1 [==============================] - 0s 25ms/step
Version Control
Run
Python Packages
TODO
Python Console
Problems
Terminal
Services
tabnine Starter
60:34 LF UTF-8 4 spaces Python 3.10
Type here to search
25°C Mostly cloudy
ENG
10:48
07-12-2022

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