
PYTHON SOFTWARE FOR GENDER DETECTION USING ARTIFICIAL INTELLIGENCE LIBRARIES TENSORFLOW, CNN, KERAS, OPENCV ON LIVE WEB CAMERA

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ABSTRACT

Gender detection is associated with increased use in a variety of software and hardware, especially with the growth of online social networking and social media websites. However, the performance of existing systems using facial images in the physical world is somewhat poor, especially when compared to the results of tasks related to facial recognition. This paper present human gender classification using a convolutional neural network (CNN) from human facial images and other AI libraries programmed with Python language. Experimental results show the highest accuracy of 98.99% when using Live Webcam for gender detection.

Keywords: CNN, Human, Recognition, AI, Libraries, Python, Gender, Detection, Frame, Face.

I. INTRODUCTION

Currently many researchers have paid more attention on gender recognition in many application fields such as smart human identification, human computer interface, facial expression recognition, emotion repression, and age estimation. For example, a gender recognition system can extract customers' gender information and adaptively play suitable advertisements. A gender recognition scheme can be a pre-processing of person identification. There are some existing gender recognition methods and they can be classified into four classes: gait-based, face-based, hand-based, and voice-based. This means that there is not a unique or generic solution to the gender recognition problem. As we know, there is a lot of information on the human face, and the information displayed on the face can indicate social interactions between people. The face is an important biometric function of humans. The first step in gender detection is face detection. In many applications such as facial recognition and emotional expression, the eyes are one of the most important parts of facial images. Human Facial Image Processing provides many clues and cues applicable to industries such as security, entertainment, etc. Human Face can provide immense amount of information like their emotional state, slightest agreement or disagreement, irony or anger, etc. This is the reason why faces have been long research topic in psychology. Gender Detection can alone provide a lot of information to places such as recruitment team of organizations, Verification of ID cards, example: Voter ID cards which millions of individual uses to cast their vote at the time of election, etc. Human Facial Image processing eases the task of finding ineligible or counterfeit individuals.

II. LITERATURE REVIEW

There are various deep learning models and machine learning algorithms to classify the gender of a person based on voice. Pitch used the Multi-Layer Perception Neural Networks for the classification of gender achieved with accuracy of 96%. Lee and Lang used the Support Vector Machine (SVM) for the gender classification. Silvosky and Nouza used the Gaussian Mixture Model to classify the gender. The machine learning algorithms like Support Vector Machine, Regression and classification can also be used. Support Vector Machine is used to classification purpose and achieved an accuracy of 95%.

III. METHODOLOGY

Basic requirement for this project includes: Python Programming Language, and libraries TensorFlow, Keras, CNN, and OpenCV, Webcam and a machine to run the project is required. This project uses Python deep learning to accurately identify the gender of specific facial data. Deep learning belongs to the machine learning family. Deep learning mimics human function. It acts as a cognitive thinking and artificial intelligence system. It can recognize objects, faces, voices, and characters in unstructured datasets. Flowchart of algorithm is shown below:

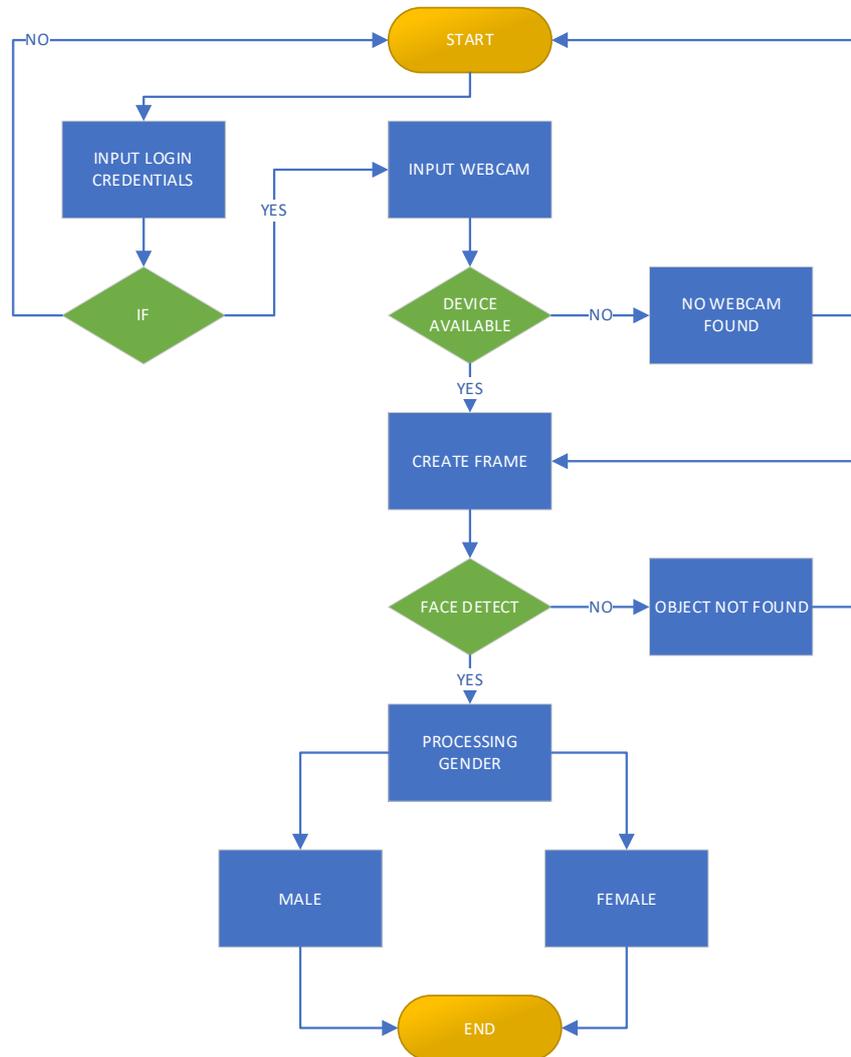


Figure 1: Flowchart of Algorithm

IV. INPUT

Main Focus of this project is to make the complete system less difficult and faster. In order to get the enter rapid there are alternatives to feed the data into the algorithm. First, User can use the system webcam or another webcam digital tool to without delay take the data.

V. FACE DETECTION

Automated facial recognition was pioneered in the 1960s. Woody Bledsoe, Helen Chan Wolf, and Charles Bisson worked on using the computer to recognize human faces. Their early facial recognition project was dubbed "man-machine" because the coordinates of the facial features in a photograph had to be established by a human before they could be used by the computer for recognition. Face recognition has a long history of research. Yang et al. compared several prominent facial recognition algorithms in 2002, but the study did not use prominent algorithms such as hair classifiers. Haar Classifier is P. It is one of the most prominent and accurate object recognition approaches described by Viola and M. Jones. In order for a face recognition system or face image system to work properly, face recognition must be properly implemented. See for a detailed overview. There are some natural changes (lighting, pose angle, face marking) and digital (noise, interference) changes that are imposed when detecting a face in a frame. The difficulty of recognizing a human face lies in two characteristics of the human face as a template: (1) The number of templates, that is, the faces to be classified, is huge and probably infinite. (2) Almost all patterns are very similar. To fix this issue and make the algorithm more efficient, we used different types of variations of audience records. The audience set also serves as a benchmark for gender detection classification in neural networks.

VI. FACE PROCESSING

If a face is detected in the frame. We can start processing with a convolutional neural network or CNN. It is a deep neural network type deep neural network mainly used for image processing. CNN conducts a test training phase and makes various predictions. Gender prediction is one of two, male and female.

VII. OUTPUT

Once we have started the project through the Command Prompt, the Login form will be displayed as a start. Once we have written the credentials well, the project window appears which starts to detect if there is object in front of the webcam, if yes, the algorithm classifies the gender. Below we are showing photos from the project.

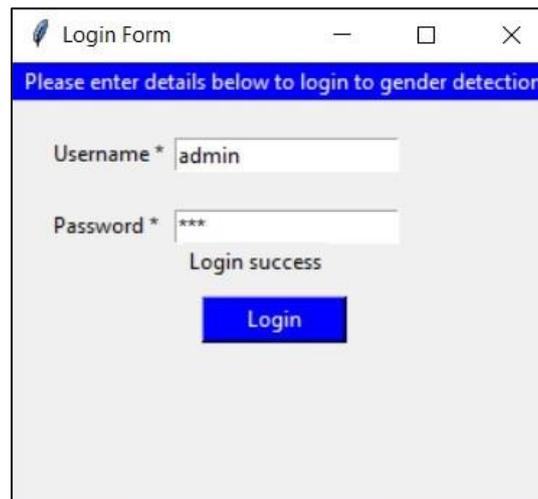


Figure 2: Login Form

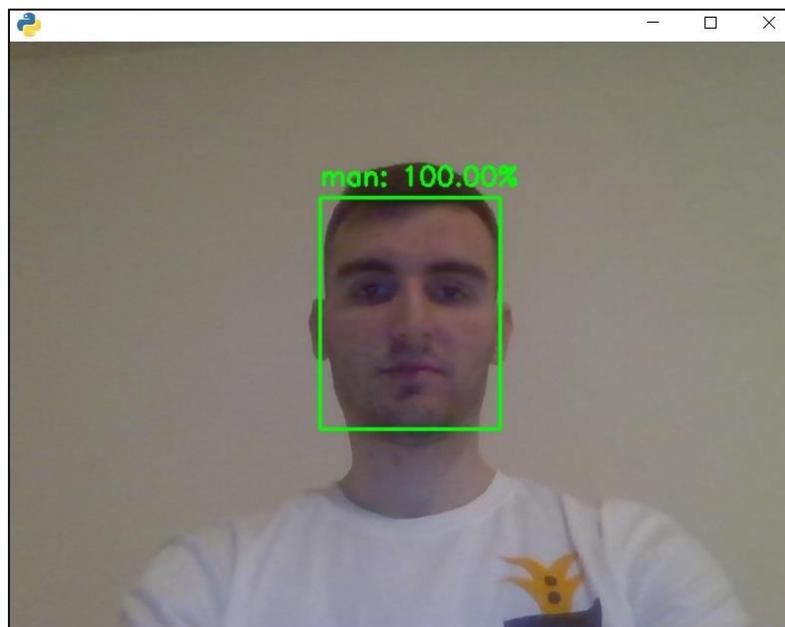


Figure 3: Output of project

We can start testing accuracy using the implemented method. procedures to be followed are:

- Enter the data.
- Create a frame.
- Detects faces.
- Categorize by gender

VIII. CONCLUSION

Human gender classification is an important resource for collecting information from and about individuals. The human face provides enough data to be used for many purposes. Gender classification of humans is very important to reach the right audience. Here I tried to run the same process, but with common equipment. The efficiency of the algorithm depends on several factors, but the main motivation for this project is to be as accurate as possible, yet simple and fast. Work is underway to improve the efficiency of the algorithm. Future improvements include face destruction like non-human objects, more datasets for people from different ethnic groups, and finer-grained control over the workflow of the algorithm.

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