Facial Image Identification Using The Viola-Jones Method

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Keywords—component, formatting, style, styling, insert (key words)

# Introduction

Identification technology using digital images has developed rapidly. Some things that are identified from digital images include fingerprints, palms, and human faces. Face identification is easier to do because it only requires a digital image with a human face which is easier to obtain compared to getting someone's fingerprints or palms. Therefore, in this paper the author will only identify faces using the Viola Jones method.

Previous research has been carried out by Yi-Qing Wang [1] with the title "An Analysis of the Viola-Jones Face Detection Algorithm" which aims to describe the Viola Jones algorithm as the first face detection system in real time. In this study, it was said that there were three ingredients for fast and accurate face detection, namely integral images, adaboost, and attention cascades.

In another study entitled "Face Detection System Based on the Viola-Jones Algorithm", a face detection process was carried out from direct images using the Viola Jones algorithm and the Adaboost algorithm from the haar feature was used to extract facial areas from images. In addition, this research also uses cascading of stages to make the process run faster [2].

In this research, the author will explain the workings of the Viola Jones method and the form of its application into a simple system using the OpneCV library and the Python programming language. When the system has been completed, it will then explain how face detection works starting from image acquisition, image processing, pattern recognition, and image analysis. Then the last test is done on facial characters that can be detected.

# Related Works

In a study entitled "Wider Face: A Face Detection Benchmark" has introduced a WIDER FACE dataset, which is a face dataset that can be used to train and evaluate face detection algorithms and has 32,203 images with 393,703 labeled faces, the number is ten times more larger than the currently available facial dataset. The WIDER FACE dataset has rich annotations, including occlusions, poses, event categories, and face bounding boxes. The facial images in the proposed dataset are very challenging because they have a large amount of variation. This research shows an example of using WIDER FACE using a multi-scale two-stage cascade framework that uses a divide and conquer strategy to deal with large-scale data variations. A set of convolutional networks with various input sizes used in this framework is trained to handle facial images with a certain scale range. Four representative algorithms were compared and evaluated at different settings and analyzed the conditions under which a method failed [3].

Another study entitled "Facial Parts Detection Using Viola Jones Algorithm" performs face detection and searches for facial features in an image by involving the viola jones cascade object detector algorithm which provides various combinations of filters and methods to detect facial expressions. The face detection process is carried out on parts of the face such as the eyes, nose, mouth, and the whole face. In this study, a face database called the Bao database was used and it gave an accuracy of 92%. The Bao database has more variations and a higher level of complexity than the AR-Face and Yale Face databases [4].

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*a**b* 

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##### Acknowledgment *(Heading 5)*

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##### References

[1] Y.-Q. Wang, “An Analysis of the Viola-Jones Face Detection Algorithm,” *Image Process. Line*, vol. 4, pp. 128–148, 2014, doi: 10.5201/ipol.2014.104.

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[3] S. Yang, P. Luo, C. C. Loy, and X. Tang, “WIDER FACE: A face detection benchmark,” *Proc. IEEE Comput. Soc. Conf. Comput. Vis. Pattern Recognit.*, vol. 2016-December, pp. 5525–5533, 2016, doi: 10.1109/CVPR.2016.596.

[4] V. K and Dr.S.Padmavathi, “Facial Parts Detection Using Viola,” *Int. Conf. Adv. Comput. Commun. Syst. (ICACCS -2015)*, pp. 1–4, 2017.