Face Detection by Fusion of Infrared and Visible Imagery

Punam Kunjekar, Pallavi Kande, Pranay Masurkar, Apurva Dangre
B.E. Scholar, Information Technology, RTMNU,DMIETR, Wardha, Maharashtra, India

ABSTRACT

This paper presents an approach of fusing the information provided by visible image with that of infrared image. However due to the limitations of hardware devices and applications in environment we are completely working on software basis. This fusion process is challenging which include object detection, extraction of features from image for that we need of different thresholding techniques. We are deciding the feature of image by extracting accurate parameters of pixels of image. Then we are training the dataset according to the features of image whether the feature is of male or female. For the training purpose we are using Carl Database.

Keywords : Face Detection, Infrared Image, Visible Image

I. INTRODUCTION

The main aim of the image processing is to extract necessary data from images. Image fusion is an augmentation technique that aims to combine images which will allow useful information to be extracted from source image and intermix in the fused image the output image will be more informative than the source image. Visible images can afford texture details with high spatial resolution and definition in a manner consistent with human visual system. Infrared images can figure out targets from their backgrounds based on the radiation difference, which works well in all-weather and all-day/night condition .We collected a Carl database which possess the known information of three kind of images i.e. Visible (Natural image),Infrared (Thermal image),Artificial image(Edited image). Firstly we perform read and write operation on visible image then convert visible image into gray scale image probably gray scale image contain the range of 0-255 pixels so that it will be convenient for calculation purpose, after that we convert gray scale image into binary image(0-1) by using thresholding technique. There are different types of thresholding such as THRESH_BINARY,THRESH_BINARY_INV,THRESH_TOZERO etc, we used THRESH _BINARY, by performing the thresholding technique we get the region of interest from image. The most challenging part is to print pixels of an image, after printing and comparing the pixel of both gray scale and binary image we highlight the region of interest of image. For the perfect detection of object from image without any distortion or noise we use object evaluation parameter such recall, precision etc. The experimental results are done to demonstrate the effectiveness of fusion visible and infrared to show whether it is male or female we use a database to train the machine to recognize the feature of male and female.
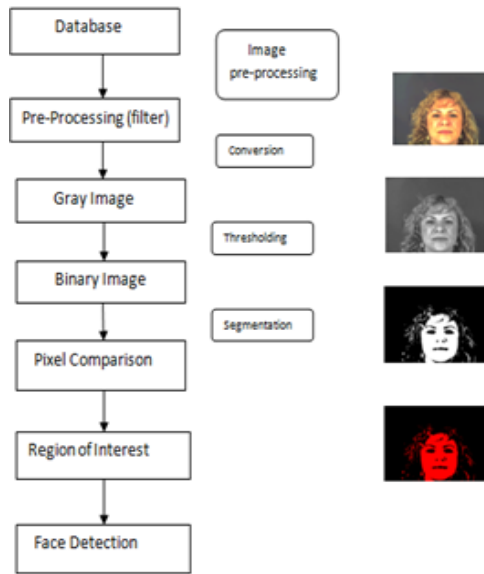
II. METHODS AND MATERIAL

Fig. Flowchart of Face Detection

In the above flowchart, we describe the each process of the face detection in that we acquire the image from the database (Carl Database) and pre-processing is done on the image by using filters. After that we convert the visible image (colour image) into gray scale image after conversion thresholding method is used to convert gray image into binary image (0-1form).compare the pixel of gray scale and binary image to detect the ROI(Region of Interest)then finally detect the object by using object detection or evaluation parameter.

III. RESULTS AND DISCUSSION

For experimental purpose we used Carl database as our experiment is software based so we do not use any kind of hardware. The program implementation was done in eclipse as our project is java based also we used Opencv platform for image processing purpose. Machine learning was done in WEKA. We analysed the improvement in the performance acquired by fusing visible and infrared imagery.

IV. CONCLUSION

In this paper we presented the schema for combining visible and infrared image for object detection and gender reorganization. To acquire accurate object from image we used thresholding technique. We used object detection evaluation parameters to identify automatically gender of object.

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