

SHAPES OF COMPUTER SKETCH DETECTION

Dr .Yadagiri Rao, ¹B.Ashwini², P. Srinivasa chary³,K.Tharuni Sri⁴,M.Varun Kumar⁵

¹ Professor & Head of the Dept, Dept of H&S, Sri Indu Institute of Engineering & Technology, Hyderabad

^{2,3}Assistant Professor, Dept. of ECE, Sri Indu Institute of Engineering & Technology, Hyderabad.

⁴⁻⁵ Student, Dept. of ECE, Sri Indu Institute of Engineering & Technology, Hyderabad.

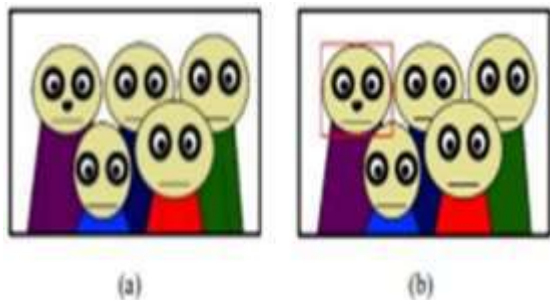
Abstract: Shape feature analysis is one of well-known research topics in image processing and can be implemented in many fields. This paper proposes a method to find a shape which is different from the other shapes of computer sketch. First, the input image will be preprocessed, such as gray scaling and blurring. After that, edges are detected using Canny algorithm and contours of the image are traced. From found contours, sorting and segmentation will be done. Finally, discrete Fourier transform is calculated and dissimilarity measurement with a template will be done using 4 different calculations such as Euclidean distance, cosine similarity [3], correlation method and Manhattan distance. The goal is to find the most different object. The proposed method is not only trying to deal with simple computer sketch but also more complex computer sketch such as overlapping objects in handwritten computer sketch and noise image. From the research, the most different object can be found in simple image, but it is still hard to be found in complex image. As future task, the research will be improved to deal with more complex image.

Key Words: Microcontroller, Sensor, Internet of things, Node MCU.

I.INTRODUCTION:

Image processing is one of ongoing research in computer science field. One subtheme of image processing is shape features analysis. Shape features

analysis is a process of analyzing geometric shape features which later can be used for shape matching [1]. There are many applications which implement shape feature analysis such as factory product inspection, biomedical engineering, finger print recognition, and content based image retrieval, etc. Shape features analysis is still one of interesting researches in image processing because there are a lot of methods which can be used and different applications which can be created. Human eyes can distinguish different object out of several objects but take a little more time when there are so many objects. It is also a bit harder to distinguish different object when it has similar shape, color or texture with another objects. Computer or robot can help human to make the job easier and faster, by detect that different object automatically. In our research, computer will find a shape which is the most different from the other shapes in the computer sketch image automatically, by comparing one shape to another shapes within the image. Computer sketch is a sketch that was created using computer applications, which are combination of shapes that are provided at computer. Handwritten computer sketch is computer sketch which is drawn manually by human using mouse or another drawing devices. The research is limited to distinguish panda face from many human faces, but it can be expanded to another applications or objects.



II.EXISTING SYSTEM:

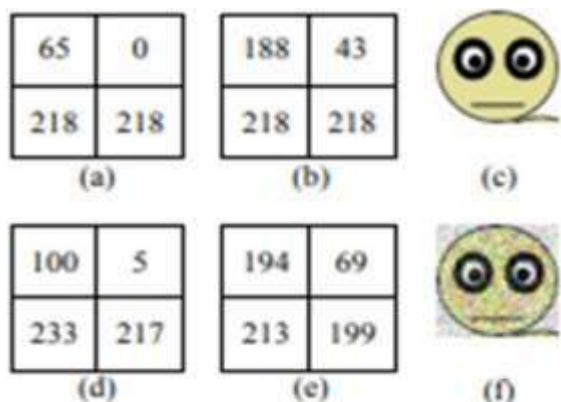
To enhance the predictability of the daily stock price trends, Yuzheng Zhai et al. [4] presented a system based on SVM algorithm that combines the technical indicators and related news releases. For each trading day, seven technical indicators are computed from the prices in the past five days. Two groups of news releases are used. Two class categories, indicating the higher or equal price and lower price than close price, are taken up for indicating next day's price movement. The system achieved higher accuracy than achieved using single source i.e. news or technical indicators.

III.PROPOSED SYSTEM:



At first, a template is created which later will be used in dissimilarity measurement process. A face from the input image is chosen randomly and will be cropped manually. The cropped image is preprocessed such as gray scaling and blurring, and is resized in the same size as the compared image. Next, the first step is preprocessing the input image, where

the RGB image will be converted into grayscale and blurred to reduce the noise. Canny edge detection is done to find the edge in the image and the contour of them will be found. Contour is list of points which have same color or intensity that created the shape in the image [4]. The contours are found using Suzuki-Abe border following algorithm [2][3]. There are so many contours which are gotten from the find contour method such as contour of the face, contour of the body, contour of the eye, etc., and its contour has its own size. Because only face contours that are needed in the dissimilarity measurement process, those contours will be sorted so that only face contours continue to the next process and the other contours will be eliminated. Before the sorting process, the face area contours are already defined manually, because it is still hard to detect face area automatically and the fix value cannot be set as the input images have different size. Based on its contour, a rectangle bounding box is created which will surround the contour and will be used to segment the contours. If there are overlapping objects, those objects will be separated into its individual object. The segmented images will be resized. Last, discrete Fourier transform (DFT)[3] and the dissimilarity measurement between template and segmented objects will be done. The shape dissimilarity will be measured using 4 different methods. There are Euclidian distance, cosine similarity, correlation method and Manhattan distance. In the measurement result, the bigger value means the objects are more dissimilar.

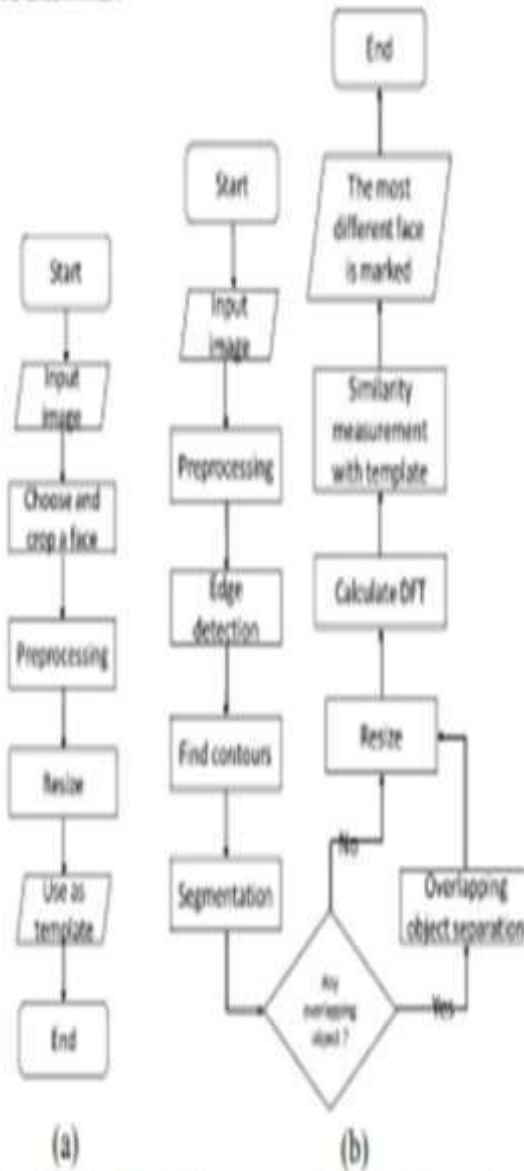


IV.WORKING PROCEDURE:

The proposed idea is explained as follows, suppose that there is a sketch of upper body of a group of people consist of some bald people in white background who are looking straight to the camera. The shape of the faces are irregular round or slightly different one into another. Also, the face of the person who is standing at the back sometimes cannot be seen entirely, which is categorized as overlapping problem in segmentation process. Among them, there is a person who is wearing a panda mask[3][5]. The computer will detect the panda mask as the most different one. The panda face is assumed to have different shape features out of all other human face. For example, the panda face has small circle around the eyes which humans don't have and the nose is also bigger than human nose. Although between human faces also has different features, such as wink eyes and not wink eyes, smile or not smile, or oval and round face which also give some different values in dissimilarity measurement, those panda shape features should also help to differentiate between panda and human in the dissimilarity measurement. In those calculations, bigger value will show the more difference of an object into another. Research illustration – (a) computer sketch of 5 persons. There is a panda masked person which is different from the other human faces; (b) the panda mask is marked as

the most different object. Based on its contour, a rectangle bounding box is created which will surround the contour and will be used to segment the contours. If there are overlapping objects, those objects will be separated into its individual object. The segmented images will be resized. Last, discrete Fourier transform (DFT)[4] and the dissimilarity measurement between template and segmented objects will be done. The shape dissimilarity will be measured using 4 different methods. There are Euclidian distance, cosine similarity, correlation method and Manhattan distance. In the measurement result, the bigger value means the objects are more dissimilar. In this research, panda face as the different shape of computer sketch has been detected by comparing them with a template and measured the dissimilarity using 4 different methods namely Euclidian distance, cosine similarity, correlation method and Manhattan distance. The panda face can be found as the most different shape with the biggest value in simple image[1]. This research can also deal with overlapping objects problem, hundred objects in the image and noise image. The influence of different size with the detection result and calculation time that are needed in dissimilarity measurement are also calculated. But, the proposed method is still hard to find the panda as the most different one in complex image. In the future, the result will be improved using another method. The research will also be done to a more complex computer sketch, such as if the face of the object does not have border, there is more people in the sketch, or if the different shape is not panda face, or better segmentation of overlapping objects and try another dissimilarity measurement method. The usage of machine learning[1-4] for better result is also taken into consideration.

UIN/03/2022/001/001



V. CONCLUSION

In this research, panda face as the different shape of computer sketch has been detected by comparing them with a template and measured the dissimilarity using 4 different methods namely Euclidian distance, cosine similarity, correlation -

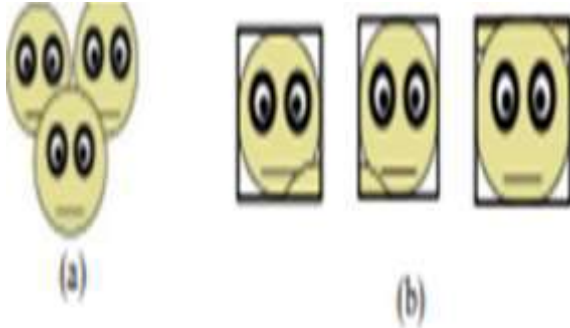
method and Manhattan distance. The panda face can be found as the most different shape with the biggest value in simple image. This research can also deal with overlapping objects problem, hundred objects in the image and noise image. The influence of different size with the detection result and calculation time that are needed in dissimilarity measurement are also calculated. But, the proposed method is still hard to find the panda as the most different one in complex image. In the future, the result will be improved using another method. The research will also be done to a more complex computer sketch, such as if the face of the object does not have border, there is more people in the sketch, or if the different shape is not panda face, or better segmentation of overlapping objects and try another dissimilarity measurement method. The usage of machine learning[1-3] for better result is also taken into consideration

VI. DISCUSSION

From the experiment which have done in simple images, panda can be detected as the most different object. Panda[2] which is the Object 8 has the biggest value or the biggest difference out of all other faces when compare with a template using 4 different dissimilarity measurement methods. The values are 3.547×10^5 when using Euclidian distance, 1.106 when using cosine similarity, 1.021 when using correlation method and 2.192×10^7 when using Manhattan distance. Even if there is noise in the image, the panda can still be found using the proposed method. In the research, the dissimilarity in noise image is expected to be higher than image without noise, because the pixels in the noise image has more difference compare to image without noise. But, from the experiments which were conducted, there are some cases where the image without noise has higher dissimilarity than noise image.

VII.RESULT

After contours are found and rectangle bounding boxes are created to segment the image, those 3 objects will be separated into its individual face and result is shown.



Sample dissimilarity measurement results in simple image using 4 different dissimilarity measurement methods; Euclidian distance, cosine similarity, correlation method and Manhattan distance are shown. Those samples are result of both image without noise and image with noise. There are 12 faces

REFERENCES

- 1.Nikhil Binoy C, Arjun N, Keerthi C, Sreerag S,Ashwin H Nair “Flood Prediction Using Flow And Depth Measurement With Artificial Neural Network In Canals.” by Proceedings of the Third International Conference on Computing Methodologies and Communication (ICCMC 2019), Palakkad, India.
- 2.Mohammed Khalaf1, Abir Jaafar Hussain, Dhiya AlJumeilThar Baker, Robert Keight, Paulo Lisboa, Paul Fergus, AlaS. Al Kafri “A Data Science Methodology Based on Machine Learning Algorithms for Flood Severity Prediction.” by 2018 IEEE, UK.
- 3.Mohamad Nazrin Napiah , Mohd Yamani Idna Idris ,

Ismail Ahmedy , Md Asri Ngadi “ Flood Alert system with android application” by 2017 IEEE, Skudai, Malaysia.

- 4.Nor Anum Zuraimi Md Noar , Mahanijah Md Kamal “The Development of Smart Flood Monitoring System using Ultrasonic sensor with Blynk Applications.” by Proc. of the 4th IEEE International Conference on Smart Instrumentation, Measurement and Applications (ICSIMA) 28-30 November 2017 Putrajaya, Malaysia.Tibin Mathew Thekkil, Dr.N.Prabakaran “Real-timeWSN Based Early Flood Detection and Control Monitoring System” by 2017 International