Computer Vision: Gesture Recognition, User Interaction, Controls and Manipulation

Syed Alfran Ali, 2015KUCP1032
Shams Ali, 2015KUCP1034
Jai Pal Singh, 2015KUCP1038
Guided by:
Dr. Neeraj Rao and Dr. Smita Naval

Indian Institute Of Information Technology, Kota

May 4, 2018

Overview

Objectives

Project Objective

`To control video/audio player using hand gestures.`

- To develop a model that recognises the hand gesture to control video/audio player.
- To create/define hand gestures and capture images.

Table: Literature Survey

Author	Paper	Objective
Swapna Agarwal *et. al.* [1] (2015)	Media Player controlled by Facial Expressions and Gestures	Classifying movement patterns Machine
Thittaporn Ganokratanaa *et. al.* [2] (2017)	Vision Based Gesture Recognition	Track six dynamic hand gestures

Table: Literature Survey

Author	Paper	Objective
R.Meena Prakash *et. al.* [3] (2017)	Finger Tip detection for Human Computer Interaction	Mouse control, operations using real time camera
Toon De Pessemier *et. al.* [4] (2017)	Intuitive Human-Device Interaction for Video Control	To use motion sensing input devices automatically authenticate a user, enable video control

Block Diagram

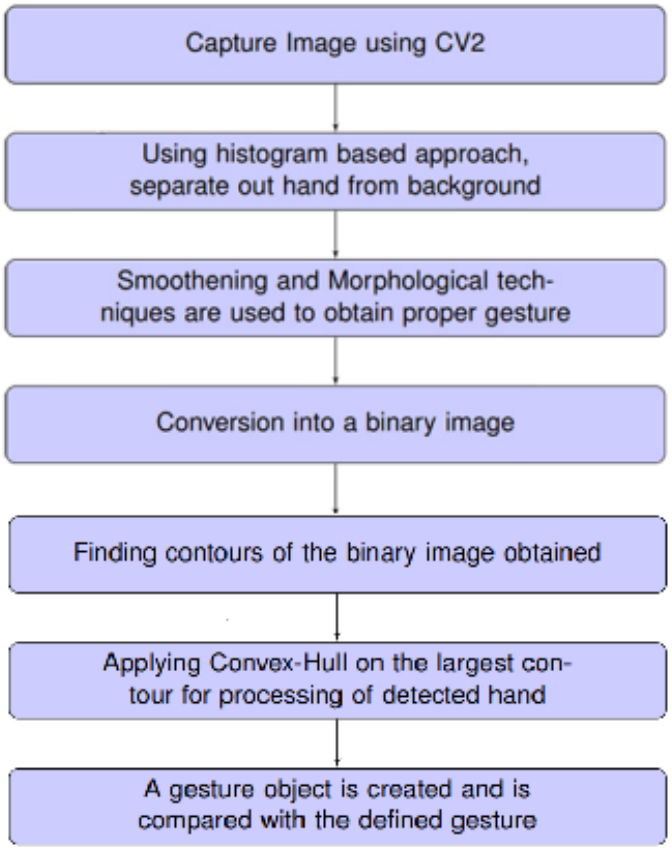


Figure: Flow Chart

Convex-Hull Algorithm

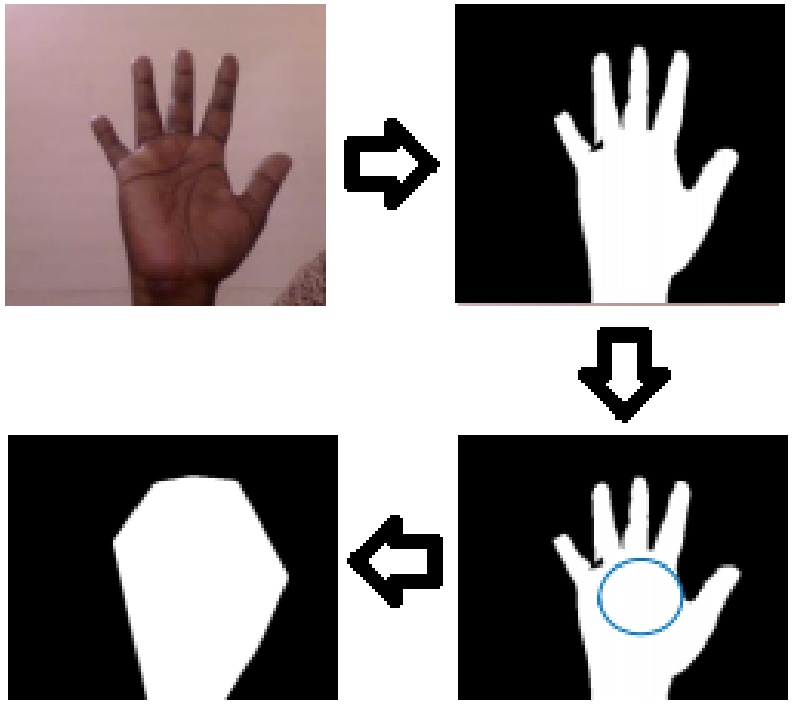


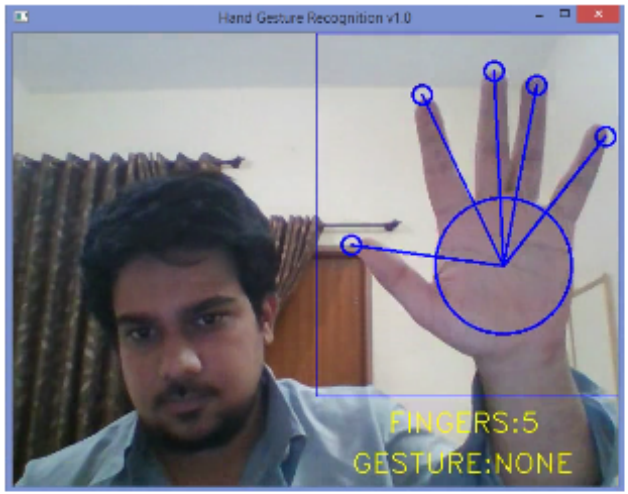
Figure: Hand Gesture Recognition(Convex-Hull)

[3]

Implementation After Mid-Term

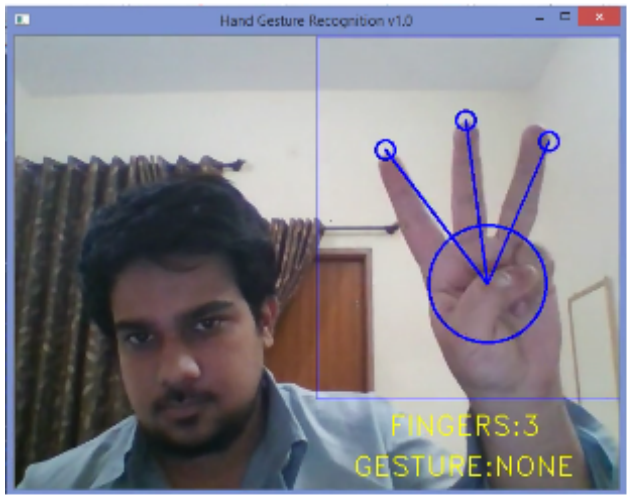
- Only Background image is captured in front of the webcam.
- Capturing the image of hand placed in front of the webcam.
- Removal of background image from the captured image of the hand.
- Applying bilateral and median filters for smoothening of the captured image.
- The corresponding gesture is recognized.

Recognized Gestures



(a) 5 Finger Gesture Recognition

(b) 3 Finger Gesture Recognition



(c) 3 Finger Gesture Recognition

(d) 0 Finger Gesture Recognition

Future Work

- To control different operations of media players using gesture recognition.
- To improve the non-tangible way of Human Computer Interaction.

References I

[1] S. Agarwal and S. Umer, "Mp-feg: media player controlled by facial expressions and gestures," in *Computer Vision, Pattern Recognition, Image Processing and Graphics (NCVPRIPG), 2015 Fifth National Conference on*, pp. 1–4, IEEE, 2015.

[2] T. Ganokratanaa and S. Pumrin, "The vision-based hand gesture recognition using blob analysis," in *2017 International Conference on Digital Arts, Media and Technology (ICDAMT)*, pp. 336–341, 2017.

[3] R. M. Prakash, T. Deepa, T. Gunasundari, and N. Kasthuri, "Gesture recognition and finger tip detection for human computer interaction," in *2017 International Conference on Innovations in Information, Embedded and Communication Systems (ICIIECS)*, pp. 1–4, 2017.

[4] T. D. Pessemier, L. Martens, and W. Joseph, "Intuitive human-device interaction for video control and feedback," in *2017 IEEE International Symposium on Broadband Multimedia Systems and Broadcasting (BMSB)*, pp. 1–7, 2017.

Thank You!