COMPUTER APPLICATIONS LAB

PROJECT

On

"HAND GESTURE RECOGNITION"

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ABSTRACT

This project shows how to recognize simple hand gestures e.g. detecting and counting fingertips using webcam, in frames of a video stream or in still images using OpenCV library. This project implements hand gesture recognition system using OpenCV on Python 3. A histogram-based approach is used to separate out a hand from the background image. The detected hand is then processed and modelled by finding contours and convex hull to recognize finger and palm positions and dimensions. Finally, a gesture object is created from the recognized pattern which is compared to a defined gesture dictionary.

INTRODUCTION

Gesture is a form of nonverbal communication which involves movement of a part of the body, especially the hand usually to express an idea. In a human interaction, we make use of speech, gestures and body movements to convey information. As computer technology continues to grow, the need for natural communication between humans and machines also increases. Although the mouse is very useful for device control, it could be inconvenient to use for physically handicapped people and people who are not accustomed to use the mouse for interaction.

The method proposed makes use of a webcam through which gestures provided by the user are captured, processed and the function related to that gesture is carried out. For example, a gesture “V” i.e. two fingers, could be predefined in the system to perform a click operation.

The system has four phases namely, image acquisition, image pre-processing, feature extraction and gesture recognition. Image acquisition involves capturing images frame by frame using a webcam.The captured images go through the image pre-processing process which involves color filtering, smoothing and thresholding. Feature extraction involves extracting features of the hand image such as hand contours. Gesture recognition involves recognising hand gestures with the help of extracted features.

HARDWARE REQUIREMENTS

Operating System : Windows 10

Processor: Dual-core

Ram : 4 GB

Hard Disk Space : 1 GB

SOFTWARE REQUIREMENTS

Developing tool:Microsoft Visual Studio

Language:Python

Library:OpenCV

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