VNUHCM - University of Science
Faculty of Information Technology
Advanced Program in Computer Science

CTT451 - Proposed Method
Single hand gesture recognition

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1 Introduction

Single hand gesture recognition can be defined as the process of analyzing and understanding meaningful movements of the hand. It acquires paramount importance due to its applications in sign language recognition, which provides better communication between deaf and dumb people and normal people. In addition, it can also be used to make wired gloves, depth-aware cameras, stereo cameras and gesture-based controllers.

2 Project Details

2.1 Theory

We will use the Kalman filter, k-means clustering, hand extraction, HoG feature extraction and SVM classification

2.2 Methodology

Firstly, we will use the Kalman filter to output a bounding box surrounding the hand by tracking the hand motion. Then we isolate the target by perform a k-mean clustering step based on the Lab colorspace. Next, we will perform hand extraction and then extract HoG features. Finally, we will train and test a SVM classifier using the extracted features.

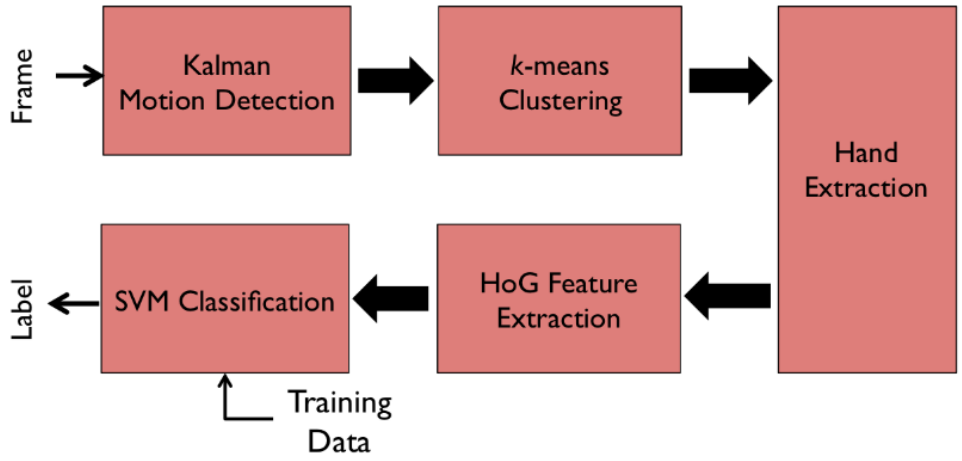

Figure 1: Overview of the proposed gesture recognition system

2.3 Time plan for project

20/11 - 26/11 Find out about the Kalman filter, k-mean clustering and some hand extraction and code them.
27/11 - 03/12 Find out about HoG feature extraction, SVM classification and code them.
04/12 - 10/12 Merge them.
11/12 - 17/12 Train and test

References

[1] Christos G. Bampis and Jinseok Choi *Single-hand gesture recognition using image/video processing and machine learning techniques*.