Human Pose Recovery and Action Detection

Piyush Kumar (11496) , Khandesh Bhange (11196)

Advisor: Dr. Amitabha Mukerjee
CS365: Artificial Intelligence

INTRODUCTION

This project can be sub-divided into three inter-connected parts:

1. Human pose recovery - Create a learning system capable of learning from several training annotated human limbs a body pose recovery.

2. Action/Interaction recognition - The focus of this part is on action/interaction recognition on RGB data, corresponding to 11 action categories - Wave, point, clap, Crouch, Jump, Walk, Run, Shake Hands, Hug, Kiss and Fight.

3. Gesture recognition for multiple instances - The focus of this track is on "multiple instance, user independent spotting" of gestures, which means learning to recognize gestures from several instances for each category performed by different users, drawn from a gesture vocabulary of 20 categories.

MOTIVATION

Determining human action is one of the most researched field in vision and Artificial intelligence. In real time tracking or just in a static image action recognition is a non-trivial job because of high variability in appearance produced by changes in the point of view, lighting conditions, and number of articulations of the human body.

RELATED WORK

Main work on which our project would be based is "Articulated pose estimation with flexible mixtures-of-parts " by Yi Yang, Deva Ramanan of University of California, Irvine.

Work done by Daniel Sanchez1 , Juan Carlos Ortega1 , Miguel Angel Bautista and Sergio Escalera in "Human Body Segmentation with Multi-limb Error-Correcting Output Codes Detection and Graph Cuts Optimization".

SOURCE CODE AND DATASET

Source code by D. Ramanan for articulated pose estimation : http://www.ics.uci.edu/~dramanan/software/pose/

Dataset: We will be using dataset provided by codelab. The dataset is composed by 9 RGB sequences, containing more than 8000 frames and more than 120000 manually labelled limbs in total. For each frame we provide the RGB image and 14 binary masks corresponding to each one of the limbs.

REFERENCES

1. Main Paper : Articulated pose estimation with flexible mixtures-of-parts
    http://www.ics.uci.edu/~dramanan/papers/pose2011.pdf
2. Main Paper: Histogram of Oriented Gradient for Human detection.
    Histograms of Oriented Gradients for Human Detection - LEAR
3. Human Body Segmentation with Multi-limb Error-Correcting Output Codes Detection
    and Graph Cuts Optimization
    http://link.springer.com/content/pdf/10.1007/978-3-642-38628-2_6.pdf