



# HUMAN ACTIVITY RECOGNITION

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#### INTRODUCTION

Applications such as surveillance, video retrieval and human-computer interaction require methods for recognizing human actions in various scenarios. Typical scenarios include scenes with cluttered, moving backgrounds, non-stationary camera, scale variations, individual variations in appearance and cloth of people, changes in light and view point and so forth. Action recognition can be achieved using local measurements in terms of spatiotemporal interest points (local features). Such features capture local motion events in video and can be adapted to the size, the frequency and the velocity of moving patterns. These local features can be combined with K Nearest Neighbors in a robust classification approach.

#### OBJECTIVE

To develop an automated mechanism and interpretation that detects activities and positional data from live video footages, recognizes and labels them for further analysis. Evaluating human activity recognition systems usually implies following expensive and time consuming methodologies. We propose an evaluation methodology to overcome the enumerated problems.

#### Material and Methods

##### Our Approach:

- Data Collection
- Feature extraction
- Activity recognition
- Learning about MATLAB.
- Implementation of Machine Learning algorithms and testing for achieving better accuracy.

##### Data Used:

- Research papers from various sources like internet, study materials etc.
- Study material provided by lecturers, students etc.
- Information related to machine learning algorithms.
- Used dataset of g 2391 sequences of six human actions (running, jogging, walking, hand clapping, hand waving and boxing) performed by 25 people in four different scenarios.

##### Implementation:

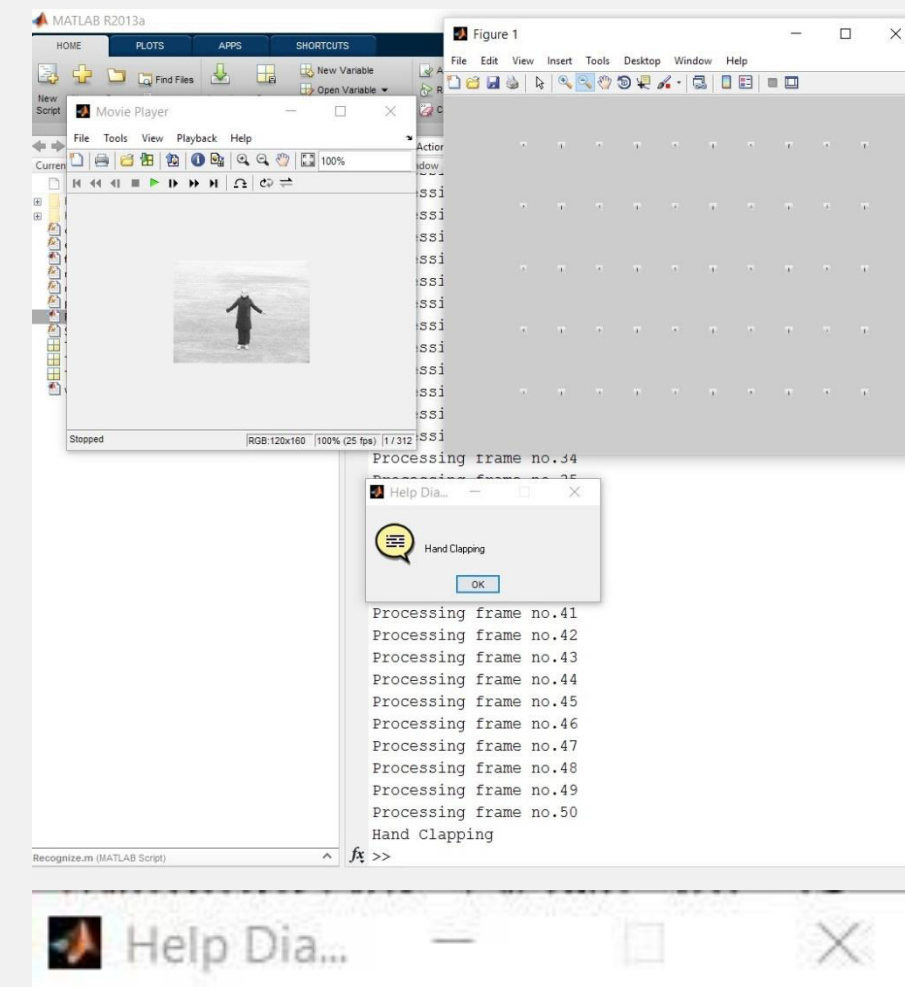
- Downloading the KTH data set.
- Using STIP function to extract features.
- Implementation of KNN algorithm
- Testing the classifier.

##### Systems/Technologies used:

- MATLAB
- Windows 7 or later.

#### RESULTS

We demonstrated how local spatio-temporal features can be used for representing and recognizing motion patterns such as human actions. By combining local features with K nearest neighbors classification we developed a method for activity recognition that gives high recognition performance compared to other relative approaches.



#### CONCLUSIONS AND LESSONS LEARNT

Representations of motion patterns in terms of local features have advantages of being robust to variations in the scale, the frequency and the velocity of the pattern. We also have indications that local features give better recognition performance in scenes with complex non-stationary backgrounds and plan to investigate this matter in future work. Using these features, the KNN classifier is able to distinguish all activities with good accuracy. Thus to classify data given as video format it proved beneficial to use the spatio-temporal features that can effectively classify the variations in the different actions.

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