## Data mining for activity extraction in video data

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**Summary.** The exploration of large video data is a task which is now possible because of the advances made on object detection and tracking. Data mining techniques such as clustering are typically employed. Such techniques have mainly been applied for segmentation/indexation of video but knowledge extraction of the activity contained in the video has been only partially addressed. In this paper we present how video information is processed with the ultimate aim to achieve knowledge discovery of people activity in the video. First, objects of interest are detected in real time. Then, in an off-line process, we aim to perform knowledge discovery at two stages: 1) finding the main trajectory patterns of people in the video. 2) finding patterns of interaction between people and contextual objects in the scene. An agglomerative hierarchical clustering is employed at each stage. We present results obtained on real videos of the Torino metro (Italy).

## 1 Introduction

Nowadays, more than ever, the technical and scientific progress requires human operators to handle more and more quantities of data. To treat this huge amount of data, most of the work can now be performed in the data-mining field to synthesize, analyze and extract valuable information, which is generally hidden in the raw data. Clustering is one of the most commonly used techniques in data mining to perform knowledge discovery tasks on large amount of data with no prior knowledge of what could be hidden in the data. There exists many clustering techniques in the literature, and the main goal of all these techniques is to obtain a partition of the data by organizing it automatically into separate groups where the objects inside a specific group are more similar to each other (with regards to their extracted and measured attributes, or variables) than to the objects of the other groups. Mining of text documents (Blatak 2005; Lemoine et al., 2005; Xing et Ah-Hwee 2005) and web-related