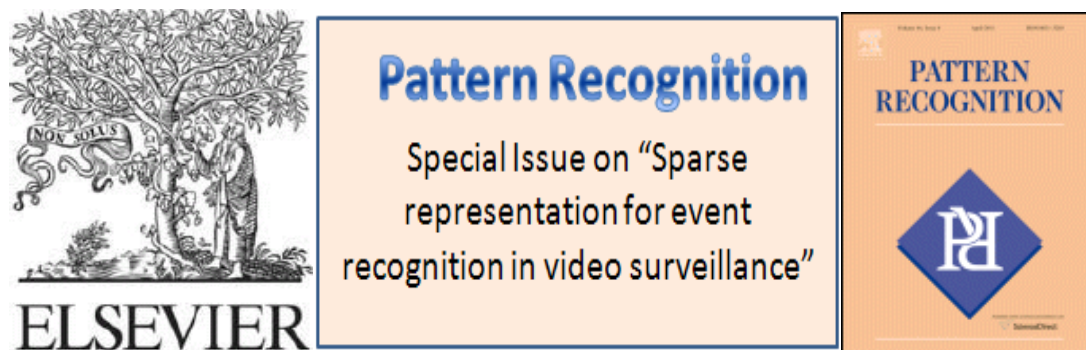Research in video surveillance has received great interest in recent years. Increased precautions are taken in security-sensitive areas, such as country borders, airports and government offices. Individuals are also seeking personalised security systems to continuously monitor their properties and valuable assets. To meet these requirements, cameras have been deployed to acquire sensory data, followed by thorough detection and assessment of threats on-line or off-line.

Understanding and interpreting object behaviours based on video analysis has witnessed tremendous progress in the last twenty years. However, the performance of finished systems still needs to be significantly improved, and many challenges remain to be solved. One of these challenges is that there is a gap between the primitive information directly extracted from images and semantic representations. To bridge this gap, a number of approaches based on features (e.g. SIFT, HoG and SURF) have been reported to address the coherence between the extracted features and their semantic interpretations. Unfortunately, due to feature redundancy and complexity, these primitive features do not always lead to consistent or semantically meaningful representations.

In recent years, sparse signal representation has proven to be an effective tool for representing and compressing images. It has been demonstrated that optimal decomposition of the signals using appropriately designed bases (e.g. wavelets, Fourier coefficients or spatio-temporal words) can lead to less ambiguity/uncertainty and computational complexity in image interpretation and representation. In spite of its success, sparsity analysis still has limitations in terms of computational efficiency and interpretation accuracy. As a result, continuous efforts are currently being made towards adaptive sparsity transformations of morphological data such as extracted events in video surveillance.

The primary purpose of this special issue is to organise a collection of recently developed analysis techniques based on sparse representations for understanding/interpreting video analysis of object behaviours. This includes object detection and tracking, segmentation, spatial and temporal features extraction, human body modelling and synthesis, event recognition, behaviour learning and applications. This special issue is intended to be an international forum for researchers to report the recent developments in this field in an original research paper style. The topics include, but are not limited to:

Sparse representation for event search and retrieval
Sparse learning in motion trajectory analysis
Object detection and tracking using sparse inference
Sparse representation for crowd behaviour analysis
Occlusion and segmentation errors handling
Sparse representation for 2D/3D articulated human body modelling
Sparsity analysis for modelling and learning object behaviours
Sparse interpretations of object behaviours

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Important Dates:

Manuscript Due	March 15, 2012
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Second round of Reviews	September 1, 2012
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