# *Abstract:* Detection and Recognition of Multiple Moving Objects in Video Sequence using Fast Level Set Method and Hidden Markov Model

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**Abstract**

In this paper, we propose a novel algorithm for the real-time detection and recognition of multiple moving objects that sequentially integrates a fast level set method and the hidden Markov model (HMM). First, we apply the Clausius entropy difference method in transformed image to detect the coarse region of the moving objects and construct a mask image covering the detected coarse region. Second, taking the initial region as the mask image given by the coarse detection step, we derive a dense detection region for moving objects by applying the curve evolution theory with a fast level set method and the smart narrow band algorithm. Third, we use a discrete wavelet transformation technique to extract proper feature vectors from the detected dense image. Finally, we use the hidden Markov model to accurately recognize moving objects. Experimental results show that our proposed method can effectively detect and accurately recognize moving objects in video sequences.

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