

## Specified Human Motion Recognition and Unknown Hand-Held Object Tracking

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**Abstract :** This paper aims to integrate human recognition, motion recognition, and object tracking technologies without requiring a pre-training database model for motion recognition or the unknown object itself. Furthermore, it can simultaneously track multiple users and multiple objects. Unlike other existing human motion recognition methods, our approach employs a rule-based condition method to determine if a user hand is approaching or departing an object. It uses a background subtraction method to separate the human and object from the background, and employs behavior features to effectively interpret human object-grabbing actions. With an object's histogram characteristics, we are able to isolate and track it using back projection. Hence, a moving object trajectory can be recorded and the object itself can be located. This particular technique can be used in a camera surveillance system in a shopping area to perform real-time intelligent surveillance, thus preventing theft. Experimental results verify the validity of the developed surveillance algorithm with an accuracy of 83% for shoplifting detection.

**Keywords :** Automatic Tracking, Back Projection, Motion Recognition, Shoplifting

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