

## Evaluation of Real-Time Background Subtraction Technique for Moving Object Detection Using Fast-Independent Component Analysis

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**Abstract :** Background subtraction algorithm is a larger used technique for detecting moving objects in video surveillance to extract the foreground objects from a reference background image. There are many challenges to test a good background subtraction algorithm, like changes in illumination, dynamic background such as swinging leaves, rain, snow, and the changes in the background, for example, moving and stopping of vehicles. In this paper, we propose an efficient and accurate background subtraction method for moving object detection in video surveillance. The main idea is to use a developed fast-independent component analysis (ICA) algorithm to separate background, noise, and foreground masks from an image sequence in practical environments. The fast-ICA algorithm is adapted and adjusted with a matrix calculation and searching for an optimum non-quadratic function to be faster and more robust. Moreover, in order to estimate the de-mixing matrix and the denoising de-mixing matrix parameters, we propose to convert all images to YCrCb color space, where the luma component Y (brightness of the color) gives suitable results. The proposed technique has been verified on the publicly available datasets CD net 2012 and CD net 2014, and experimental results show that our algorithm can detect competently and accurately moving objects in challenging conditions compared to other methods in the literature in terms of quantitative and qualitative evaluations with real-time frame rate.

**Keywords :** background subtraction, moving object detection, fast-ICA, de-mixing matrix

**Conference Title :** ICASISP 2022 : International Conference on Acoustics, Speech, Image and Signal Processing

**Conference Location :** Rome, Italy

**Conference Dates :** October 13-14, 2022