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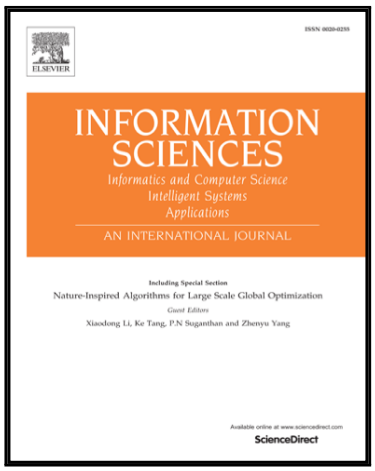

Pedestrian Detection by Learning a Mixture Mask Model and Its Implementation

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Pedestrian Detection by Learning a Mixture Mask Model and Its Implementation

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Abstract

Pedestrian detection from videos is a useful technique in intelligent transportation systems. Some key challenges of accurate pedestrian detection are the large variations in pedestrian appearance as the pedestrians assume different poses and the different camera views that are involved. This makes the generic visual descriptors unreliable for real-world pedestrian detection. In this paper, we propose a high-level human-specific descriptor for detecting pedestrians in multiple videos. More specifically, by obtaining the feature matrix from a sliding window, we use multiple mapping vectors to project the original feature matrix into different mask spaces. Inspired by the part-based model [12], it is natural to formulate the pedestrian detection into a multiple-instance learning (MIL) framework. Afterward, we adopt an MI-SVM [9] to solve it. To evaluate the proposed detection algorithm, we implement the pedestrian detection algorithm in FPGA, which can process over 30 fps. Moreover, our method outperforms many existing object detection algorithms in terms of accuracy.

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