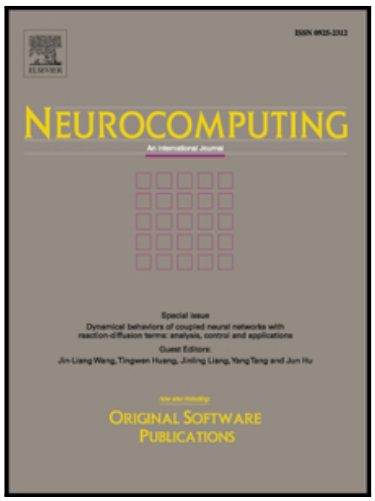

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Discriminative Latent Semantic Feature Learning for Pedestrian Detection

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Abstract

Features act as a key factor in pedestrian detection task. Most widely-used ones like HOG are manually designed and hard to be adaptive, thus now more attention has been paid to the features automatically learned on data. In this paper, a novel approach of learning discriminative features is proposed, addressing two main limitations of the methods in the literature. On one hand, unlike those methods of learning features on low-level pixels, we propose to learn features via a particular sparse coding algorithm enhanced on mid-level image representation, in order to obtain higher-level latent semantics and robustness; On the other hand, those methods usually utilize label information in model training such as deformable part model (DPM) with high computation cost. Instead, we propose to extend the learning process via a maximum margin criterion, in order to better encode discriminative information directly in features by optimizing them to be close to each other if from the same class and far from each other if from different classes. Furthermore, a boosted detection framework rather than the complex DPM is adopted to achieve both high accuracy and efficiency. The proposed approach achieves promising results on several standard pedestrian detection benchmarks.

Keywords: Pedestrian detection, feature learning, latent semantics,

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