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Abstract

Capturing the dynamics of pedestrians, vehicles, and other objects on a video sequence, leads to further knowledge of what is happening on a scene. In this paper, a targlet framework is developed to detect pedestrians, which associates each person with an autonomous entity called targlet (target+aglet), and tracks those targlets through the sequence. The particularity of our methodology is the use of a movement feature space (MFS) to generate descriptors for the classifier and the tracker. In addition, the dynamics of each person, trajectory and speed, is modeled inside the framework as a state machine. This approach is applied to two public sequences (PETS2009_S2L1 and TownCentre), and two new ones, which were captured at a traffic junction (GS06 and GS54). The results of the detection step are more accurate than those of the classifiers which did not use temporal information. The tracking results are comparable to other algorithms reported in the literature, which have, however, a higher computational complexity. Examples in the analysis of the targlet framework show their capacity to easily acquire information from the scene, i.e. pedestrian behavior. We believe our approach can be adapted and used for tracking applications concerning other objects, such as vehicles, biological models, etc.

Keywords: pedestrian tracking, movement feature space, tracking-by-detection, targlet framework, application layer

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