Title:	Photopic Scotopic Multimodal Tracking
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Keyword(s):	Object,Tracking Feature, Extraction Motion, Model
Subject(s):	Computer Vision
Abstract:	Tracking is a challenging problem in computer vision. At the same time, tracking tasks are in great demand in a lot of vision problems. There are different state-of-art algorithms and methodologies developed for tracking, but generally they work effectively for specific situations. Therefore, we often need to have different tracker algorithms for different situations. In this thesis, a more general tracking methodology has been proposed, and therefore, it is more robust. If there is large scale variation in illumination around the scene containing the target, the tracking becomes very difficult as its appearance differs continually with the illumination. In both situations of excessive illumination and insufficient illumination, the object appears poorly coloured or unsaturated due to illumination conditions designated as whitewash and blackwash respectively. Considering the above as the base problem of this thesis, we come up with the idea of switching between two different trackers. One tracker uses color features, and is applied in situations of 'acceptable illumination with good CRI, considered photopic illumination conditions, while the other is based on non-color (greyscale) features, meant for use in 'scotopic' illumination conditions. Both trackers are maintained in parallel, and depending upon the current illumination of scene, the parent algorithm switches from one to the other in real time, depending upon which is expected to perform better at the moment. Apart from this, the expected position of the target for the next frame is predicted with a constant velocity model. Therefore, even if the target is moving in continuous illumination changing environment, the proposed switching tracker can track effectively. Performance evaluation has been done for comparison with different trackers reported in the literature with the help of success and and precision plot.

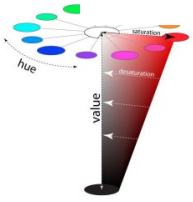


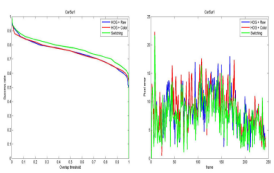
Figure 2.2: HSV Color Space [1]

CarSur3, Frame 123 Frame 215 Frame 277 Frame 326

Figure 3.1: CarSur3

CarSur1, Frame 82 Frame 126 Frame 155 Frame 223

Figure 3.2: CarSur1



(a) success plot (b) precision plot

Skiing, Frame 1 Frame 4 Frame 51 Frame 74

Figure 3.3: Skiing

Basketball,Frame 89 Frame 288 Frame 482 Frame 652

Figure 3.8: Basketball