Hybrid Deep Learning Based Moving Object Detection via Motion prediction

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Abstract— Deep learning has made considerable progress in the field of detection, and dramatically improves the mean Average Precision (mAP) of detection. Deep learning-based detection methods have complex network structures which need more computing resources to meet the real-time requirement. In many real-time applications, such as the robot vision field, the detection speed is an important metric. Although the traditional method based on hand-designed features usually has a fast speed, the mAP of detection is unsatisfactory. To get both fast and accurate detection, we use a motion prediction model to combine the result of deep learning-based detection and traditional detection. We choose YOLOv2 as the detection algorithm for deep learning, so our method is called Hybird YOLO Motion Model(HYMM). Considering the current object position and its movement information, the object motion prediction model can obtain the confidence regions with high probability. Our experiments show that the proposed method achieves better performance with high detection speed than the deep learning-based detection method.

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