

Algorithm Research on Traffic Sign Detection Based on Improved EfficientDet

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Abstract : Aiming at the problems of low detection accuracy of deep learning algorithm in traffic sign detection, this paper proposes improved EfficientDet based traffic sign detection algorithm. Multi-head self-attention is introduced in the minimum resolution layer of the backbone of EfficientDet to achieve effective aggregation of local and global depth information, and this study proposes an improved feature fusion pyramid with increased vertical cross-layer connections, which improves the performance of the model while introducing a small amount of complexity, the Balanced L1 Loss is introduced to replace the original regression loss function Smooth L1 Loss, which solves the problem of balance in the loss function. Experimental results show, the algorithm proposed in this study is suitable for the task of traffic sign detection. Compared with other models, the improved EfficientDet has the best detection accuracy. Although the test speed is not completely dominant, it still meets the real-time requirement.

Keywords : convolutional neural network, transformer, feature pyramid networks, loss function

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