

Subtask-dominated Supervised Pretraining Transfer Learning for Person Search

Chuang Liu¹
 niklaus@sjtu.edu.cn
 Hua Yang^{1,2}
 hyang@sjtu.edu.cn
 Shibao Zheng^{1,2}
 sbzh@sjtu.edu.cn

¹ The Institute of Image Communication
 and Network Engineering
 Department of Electronic Engineering
 Shanghai Jiao Tong University
 Shanghai, China
² Corresponding Authors

Impact on detection.

The SSP method and MRFP layer are proposed to improve person search performance by boosting the performance of the person Re-ID subtask. Experiments are conducted to explore their impact on the person detection subtask. Experimental results are reported in Table 1. The SSP method causes a little detection performance degradation compared to ImageNet pretraining method. Nonetheless, the overall person search performance is improved by a large margin. This demonstrates that it is feasible to take the person Re-ID as the dominant subtask for the multi-task one-step person search framework. Generally, the proposed SSP can significantly boost the overall person search performance at the cost of a slight detection performance degradation.

Method	AP (%)	Recall (%)
Baseline (ImageNet)	95.0	92.5
Baseline (SSP)	94.4	91.9
Baseline (ImageNet)+MRFP	95.0	92.5
Baseline (SSP)+MRFP	94.0	91.7

Table 1: Person detection performance evaluation.

Visualization of Initial Feature Maps.

We compare the ImageNet pretraining method and the proposed SSP method by visualizing the initial feature maps of the base networks. As shown in Fig. 1, person areas of the output feature maps in the SSP method are brighter than those in the ImageNet pretraining method, which indicates that the proposed SSP method can make the one-step person search model focus more on the person RoIs in scene images compared to the ImageNet pretraining method before the training of the one-step person search model. This means that our SSP

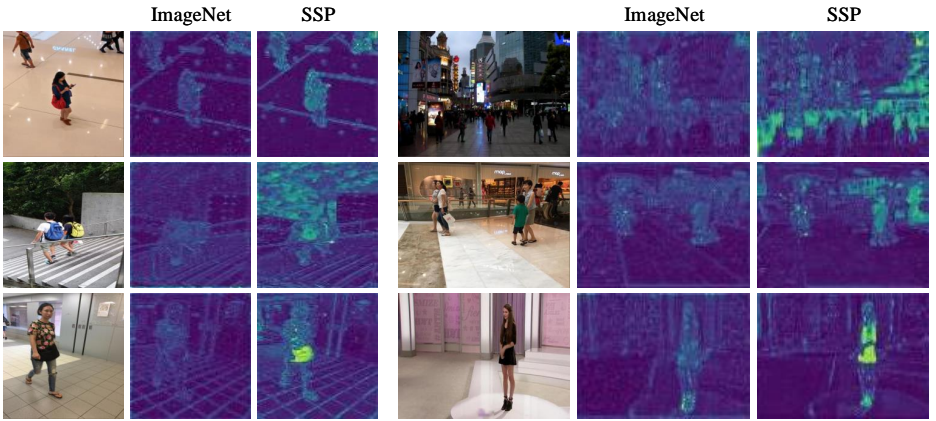


Figure 1: Initial feature maps visualization of ImageNet pretraining and our SSP method.

method can provide a better initial solution for the one-step person search model. Consequently, the proposed SSP method can help the one-step person search model learn more discriminative person features after retraining.