

嵌套池化三元组卷积神经网络的行人再识别

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摘 要: 针对行人再识别易受遮挡, 光照、视角等非理想条件变化的影响, 提出一种嵌套池化三元组卷积神经网络. 它在均方根池化后依次添加平均池化和最大池化提取全局特征, 并通过最短路径损失自动对齐局部特征. 然后采用改进型 Log-logistic 函数代替传统三元组损失函数训练网络, 得到与局部特征联合优化的全局特征. 在 Market-1501、CUHK03 和 VIPeR 数据集上的识别率都比基于传统方法的提高了 5% 以上. 实验结果表明, 本文提出的嵌套池化三元组卷积神经网络, 能有效解决非理想自然条件下存在的部分遮挡、分辨率低和旋转变化等问题, 同时具有良好的泛化能力和适用范围.

关键词: 行人再识别; 嵌套池化; 三元组损失函数; 局部特征; 间接度量

Pedestrian re-identification of nested pooling triple

convolutional neural networks

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Abstract: A nested pooling tri-tuple convolution neural network is proposed for pedestrian re-identification, which is vulnerable to occlusion, illumination, viewing angle and other non-ideal conditions. It adds the average pooling and maximum pooling to extract global features in turn after the root mean square pooling, and automatically aligns the local features with the shortest path loss. Then the improved Log-logistic function is used instead of the traditional triple loss function to train the network, and get global features jointly optimized with local features. The recognition rates on the Market-1501, CUHK03, and VIPeR datasets are both more than 6% higher than those based on traditional methods. The experimental results show that nested pooling tri-tuple convolutional neural network proposed in this paper can effectively solve the problems of partial occlusion, low resolution and rotation change under non-ideal natural conditions, and has good generalization ability and scope of application.

Key words: person re-identification; nested pooling; ternary loss function; local features; indirect metric

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