Single-Stage Instance Shadow Detection with Bidirectional Relation Learning

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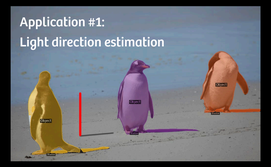
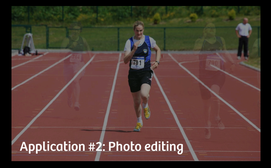
Introduction

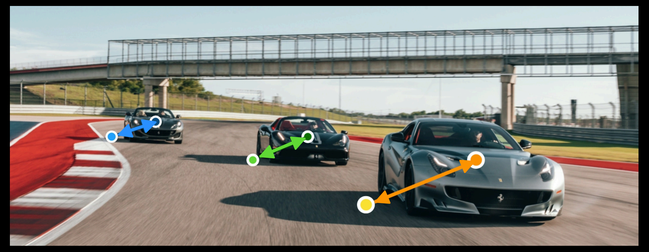
Instance Shadow Detection aims to find shadow instances, object instances and shadow-object associations; this task benefits many vision applications, such as light direction estimation and photo editing.





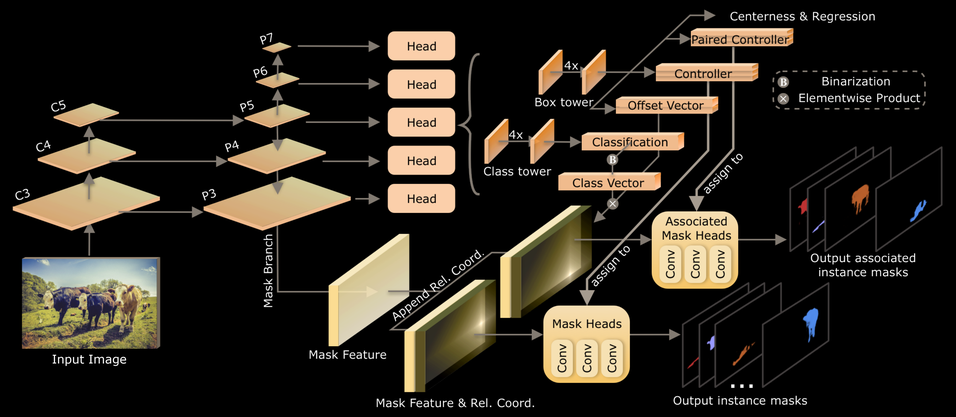
In this paper, we present a new single-stage fully convolutional network architecture with a bidirectional relation learning module to directly learn the relations of shadow and object instances in an end-to-end manner. The experimental results demonstrate that our method outperforms the state-of-the-art method with an improvement of over 29% in accuracy.

Motivation

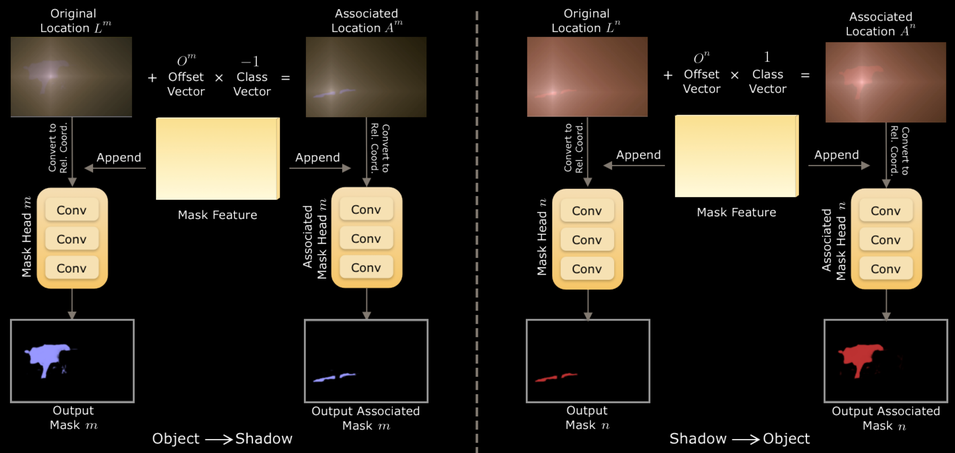


We explore the inherent correlation directly between the shadow and object instances, and present to learn the offset vector from the center of each shadow instance to the center of the associated object instance, as well as the other way around.

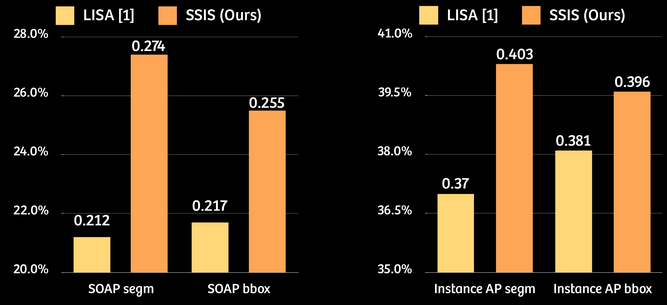
Single-Stage Instance Shadow Detection Network (SSIS)



Bidirectional Relation Learning Module



Quantitative Comparison with the State-of-the-art Method



Qualitative Comparison with the State-of-the-art Method

Input image | LISA [1] | SSIS (Ours) | Paired location learned by SSIS

Reference

[1] Tianyu Wang*, Xiaowei Hu*, Qiong Wang, Pheng-Ann Heng, and Chi-Wing Fu. Instance Shadow Detection. In CVPR 2020.

Code on Github