IMAGE DEBLURRING

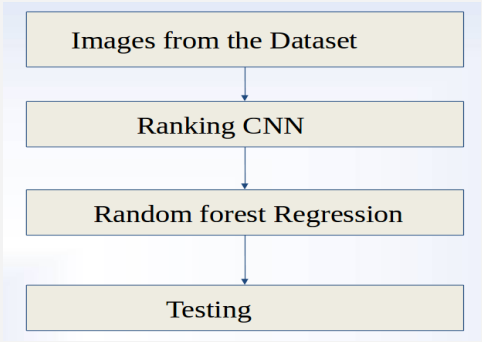
Aim

The aim of this project is to deblur the given blur image into a clear image by removing the unwanted noise.

Introduction

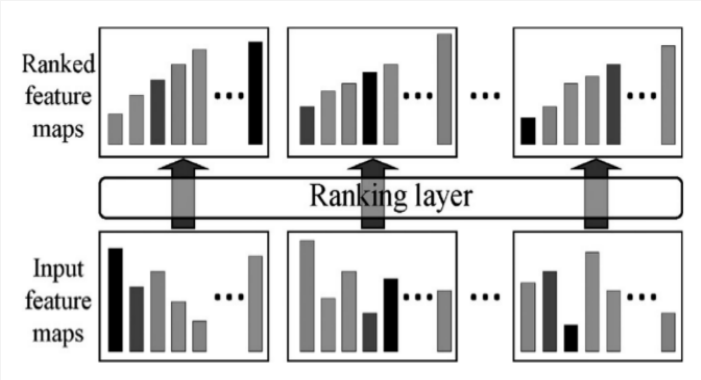
In real world scenarios, small particles suspended in the atmosphere often scatter the light. As a consequence, the clarity of an image would be seriously degraded, which may decrease the performance of many multimedia processing systems. Image enhancement methods can only alleviate this problem slightly. It is widely acknowledged that a blur image can be regarded as a convex combination of scene radiance and atmospheric light.As a result, the task of image deblurring can be formulated as recovering the scene radiance from a blur image by estimating the atmospheric light and the transmission.

Architecture



Ranking CNN:

There are two types of attributes that influence the performance of transmission estimation, including statistical attributes and structural attributes.CNN performs impressively on capturing the structural attributes due to the usage of convolutional layers, while it often lacks the ability to extract statistical attributes. To enhance the ability in extracting blur-relevant features, a ranking layer is added to the classical CNN so as to construct a novel Ranking-CNN.Ranking-CNN has ten layers.



Result

A blur image is uploaded from the GUI which is converted into a clear image with accuracy of 86%.

Conclusion

Equipped with the novel ranking layer, Ranking-CNN captures the structural and statistical features simultaneously. Based on the learned features, a regression model is further trained to predict haze density for effective haze removal. Experimental results show that Ranking-CNN features are effective.

References

[1] Mahdi S. Hosseini, and Konstantinos N. Plataniotis "Convolutional Deblurring for Natural Imaging"

[2] J. Sun, W. Cao, Z. Xu, and J. Ponce,"Learning a convolutional neural network for non-uniform motion blur removal," in Proc. CVPR, 2015, pp. 769–777.

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