מכון ויצמן למדע

THE WEIZMANN INSTITUTE OF SCIENCE

FACULTY OF MATHEMATICS AND COMPUTER SCIENCE

Vision and Robotics Seminar

Room 1 ,Ziskind Building
on Thursday, Jan 08, 2015
at 12:15

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Blind deblurring and blind super-resolution using internal patch recurrence

Abstract:

Small image patches tend to recur at multiple scales within high-quality natural images.
This fractal-like behavior has been used in the past for various tasks including image compression, super-resolution and denoising. In this talk, I will show that this phenomenon can also be harnessed for "blind deblurring" and for "blind super-resolution", that is, for removing blur or increasing resolution without a-priori knowledge of the associated blur kernel. It turns out that the cross-scale patch recurrence property is strong only in images taken under ideal imaging conditions, but significantly diminishes when the imaging conditions deviate from ideal ones. Therefore, the deviations from ideal patch recurrence actually provide information on the unknown camera blur kernel.
More specifically, we show that the correct blur kernel is the one which maximizes the similarity between patches across scales of the image. Extensive experiments indicate that our approach leads to state of the art results, both in deblurring and in super-resolution.

Joint work with Michal Irani.