



THE WEIZMANN INSTITUTE OF SCIENCE  
FACULTY OF MATHEMATICS AND COMPUTER SCIENCE

Vision and Robotics Seminar

Room 1 ,Ziskind Building  
on Thursday, May 18, 2017  
at 12:15

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Technion

Regularization by Denoising (RED)

Abstract:

Image denoising is the most fundamental problem in image enhancement, and it is largely solved: It has reached impressive heights in performance and quality -- almost as good as it can ever get. But interestingly, it turns out that we can solve many other problems using the image denoising "engine". I will describe the Regularization by Denoising (RED) framework: using the denoising engine in defining the regularization of any inverse problem. The idea is to define an explicit image-adaptive regularization functional directly using a high performance denoiser. Surprisingly, the resulting regularizer is guaranteed to be convex, and the overall objective functional is explicit, clear and well-defined. With complete flexibility to choose the iterative optimization procedure for minimizing this functional, RED is capable of incorporating any image denoising algorithm as a regularizer, treat general inverse problems very effectively, and is guaranteed to converge to the globally optimal result.

\* Joint work with Peyman Milanfar (Google Research) and Yaniv Romano (EE-Technion).