



THE WEIZMANN INSTITUTE OF SCIENCE
FACULTY OF MATHEMATICS AND COMPUTER SCIENCE

Vision and Robotics Seminar

on Thursday, May 13, 2021
at 12:15

<https://weizmann.zoom.us/my/assaf.shocher?pwd=K25wMVFLMzhYM2cxZXJsNTdyUGozUT09>

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Deep Internal Learning

Abstract:

Deep Learning has always been divided into two phases: Training and Inference. The common practice for Deep Learning is training big networks on huge datasets. While very successful, such networks are only applicable to the type of data they were trained for and require huge amounts of annotated data, which in many cases are not available. In my thesis (guided by Prof. Irani), I invented "Deep Internal Learning". Instead of learning to generally solve a task for all inputs, we perform "ad hoc" learning for specific input. We train an image-specific network, we do it at test-time and on the test-input only, in an unsupervised manner (no label or ground-truth). In this regime, training is actually a part of the inference, no additional data or prior training is taking place. I will demonstrate how we applied this framework for various challenges: Super-Resolution, Segmentation, Dehazing, Transparency-Separation, Watermark removal. I will also show how this approach can be incorporated to Generative Adversarial Networks by training a GAN on a single image. If time permits I will also cover some partially related works. Links to papers: <http://www.wisdom.weizmann.ac.il/~vision/zssr>
<http://www.wisdom.weizmann.ac.il/~vision/DoubleDIP>
<http://www.wisdom.weizmann.ac.il/~vision/ingan>
<http://www.wisdom.weizmann.ac.il/~vision/kernelgan> <https://semantic-pyramid.github.io/>
<https://arxiv.org/abs/2006.11120> <https://arxiv.org/abs/2103.15545>