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 24, 2019
at 12:15

Idan Kligvasser
Technion

xUnit: Learning a Spatial Activation Function for Efficient Visual Inference

Abstract:

In recent years, deep neural networks (DNNs) achieved unprecedented performance in many vision tasks. However, state-of-the-art results are typically achieved by very deep networks, which can reach tens of layers with tens of millions of parameters. To make DNNs implementable on platforms with limited resources, it is necessary to weaken the tradeoff between performance and efficiency. In this work, we propose a new activation unit, which is suitable for both high and low level vision problems. In contrast to the widespread per-pixel activation units, like ReLUs and sigmoids, our unit implements a learnable nonlinear function with spatial connections. This enables the net to capture much more complex features, thus requiring a significantly smaller number of layers in order to reach the same performance. We illustrate the effectiveness of our units through experiments with state-of-the-art nets for classification, denoising, and super resolution. With our approach, we are able to reduce the size of these models by nearly 50% without incurring any degradation in performance.

*Spotlight presentation at CVPR'18 (+ submitted extension)

A joint work with Tamar Rott Shaham and Tomer Michaeli