Dr' Aharon Bar–Hillel ABC Robotics Seminar on November 28

Title: Convolutional Table Ensembles – visual classification in the microsecond scale

Abstract:

I will present and discuss a family of visual classifiers/predictors termed Convolutional Tables Ensemble (CTE), providing unique accuracy-speed trade off opportunities. A CTE is composed of a set of fern or tree structures, operating convolutionally on the image. The architecture enables sparse utilization of an exponential number of features (hundreds of thousands is a typical number) in a linear computation time. The optimization iterates between solving a convex optimization problem with existing features and adding a new (exponentially large) set of features at once. The training framework enable trading training sample size for speed, while keeping a fixed level of accuracy. While the architecture is flat, for a computational budget lower than one CPU millisecond it outperforms convolutional neural networks, providing the same accuracy with 5-200X speedup. The extreme speed enables construction of complicated chains including dozens of classifiers in a single system. Specifically, I will present such a system for hand pose estimation, achieving state-of-the-art accuracy in 15 CPU millisecond, an order of magnitude faster than its competitors.

Joint work with Eyal Krupka, Kfir Karmon and many other partners.

Bio:

Aharon Bar–Hillel is a computer vision and machine learning researcher. He got his Ph.D from the Hebrew university of Jerusalem at 2006. Since then he has been working as a research scientist in the industry at Intel research, GM research and Microsoft research. At October 2016 he joined the industrial engineering and management department at BGU as a senior lecturer.

See the home page https://sites.google.com/site/aharonbarhillel/ for more details.