

4<sup>th</sup> International Conference on

# BIG DATA ANALYSIS AND DATA MINING

September 07-08, 2017 | Paris, France



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### Smart data acquisition and analysis for deep learning based systems

Deep Learning (DL) becomes the method of choice in many fields of computer science, including computer vision, Natural Data Processing (NLP), autonomous systems, and many others. While DL methods are known for their superior performance, in order to achieve it, large amount of training examples are required. Furthermore, the quality of training examples affects largely the performance of DL training and learnt model quality. In particular, if the training examples represent well the real world phenomena, a good model is expected to learn. If, on the other hand, the examples are highly correlated and represent only sparse knowledge about phenomena, the learnt model quality will be low. In this talk, we present several general principles and methods to diagnose the data quality, and also the suitability of DL architecture to model the data at hand. We also propose several methods to pre-process raw data to better suit the requirements of DL systems. We show several examples of applications of our framework to various datasets, including known large image datasets with millions of images, binary sequence sets, gene datasets, and others. We show the efficacy of the proposed methods to analyze and predict the performance of DL methods on a given data.

### Biography

Pavel Kisilev serves as the CTO of Artificial Intelligence at Huawei Research Center in Israel. He completed his Graduation at Technion, Israel Institute of Technology in 2002 with a PhD in Electrical Engineering. Before joining Huawei, he was a Lead Scientist at IBM Research from 2011-2016, a Senior Research Scientist at HP Labs from 2003-2011, and a Research Associate at Technion. His research interests include computer vision, deep learning, general statistical methods, and inverse problems. He is an author of over 50 filed patents, three book chapters, and of nearly 50 papers in top journals and conferences in computer science.

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