



Prof. Alexander Balinsky
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Title: On Semi-Supervised Learning and Compressive Sensing

Abstract:

“In this talk we present a connection between semi-supervised learning and compressive sampling. We show that sparsity and compressibility of the learning function can be obtained from heavy-tailed distributions of filter responses or coefficients in spectral decomposition. In many cases the NP-hard problems of finding sparsest solutions can be replaced by l_1 -problems from convex optimization theory, which provide effective tools for semi-supervised learning. We present several conjectures and examples. As an example of the application of our results, we consider the colorization problem of natural images.”

Biography

Prof. Alexander Balinsky received his PhD degree in Mathematical Physics from the Landau Institute of Theoretical Physics in 1990 and was Research Fellow in the Department of Mathematics at The Technion-Israel Institute of Technology from 1993 till 1997. He joined Cardiff University in 1997. He is a Professor in the Cardiff School of Mathematics and WIMCS (Wales Institute of Mathematical and Computational Sciences) Chair in Mathematical Physics. His current research interests lie in the areas of spectral theory, stability of matter, image processing and machine learning. He has participated in EU TMR network on Partial Differential Equations and Quantum Mechanics (1996-2001). He was PI on three years grant from United State-Israel Binational Science Foundation (1996-1999), on three years EPSRC Research Grant 2003-2006. He was founding member of Cardiff Communication Research Center. In 2007-2011 he had joint with Hewlett-Packard EPSRC CASE award, and from October 2011 joint with Hewlett-Packard 50%-50% PhD Scholarship. He also did consultancy work for Reuters, London on mathematical models for Internet Security.