Michele Villa

Title: Quantitative differentiation, Poincarè inequalities and statistical learning theory.

Abstract. In this talk I will give an overview of various recent results concerning quantitative differentiation of Lipschitz and Sobolev functions in geometric contexts. For example, I will present an extension of Dorronsoro theorem to uniformly rectifiable sets and show that all uniformly rectifiable sets may be covered with a surface supporting a Poincaré inequality. I will then apply this theory to problems in unsupervised and supervised statistical learning. These results come from various joint works with J. Azzam, E. Caputo, M. Hyde, M. Mourgoglou, R. Schul and I. Violo.