THE UNIVERSITY OF CHICAGO

Department of Statistics

DISSERTATION PROPOSAL PRESENTATION

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SPARSITY

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ABSTRACT

In McCullagh & Polson (2018), sparsity is defined as a limiting property of a sequence of probability measures converging to the Dirac delta measure at zero. As such, sparsity can be seen as an approximation device which allows one to derive sparse asymptotic integral approximations, regardless of the sample size. We focus on two main lines of research. The first one investigates the possibility of going beyond the first order term in the sparse approximation. We observe different patterns across different sparse families and not all of the first order equivalence relations appear to carry over to higher order terms. The second line is directed to extend this mathematical definition of sparsity to distributions defined on $\mathbb{R}^d$, $d > 1$. For now, a notion of vector sparsity, together with the corresponding theory for the signal plus noise convolution and linear regression, has been developed for rotationally invariant distributions. Future work will aim at developing a theory for component-wise sparsity.
