



STATISTICS DEPARTMENT COLLOQUIUM

MONDAY, FEBRUARY 23, 2009

Talk: 4:00 PM – *Science Center 309*

Reception: 5:15 PM – *Science Center, 7th Floor*

“A General Framework for Multiple Testing Dependence”^{*}

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ABSTRACT

I will present a general framework for performing large-scale significance testing in the presence of arbitrarily strong dependence. We have derived a low-dimensional set of random vectors, called a dependence kernel, that fully captures the dependence structure in an observed high-dimensional data set. This result shows a surprising reversal of the “curse of dimensionality” in the high-dimensional hypothesis testing setting. We have also shown theoretically that conditioning on a dependence kernel is sufficient to render statistical tests independent regardless of the level of dependence in the observed data. Finally, I demonstrate that this framework for multiple testing dependence has implications in a variety of common multiple testing problems, such as in gene expression studies, brain imaging, and spatial epidemiology.

^{*} This work is “part 2” of the talk I gave at Harvard in Fall 2007.