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Global Testing for Dependent Bernoullis

MONDAY, March 1, 2021 at 4:00 PM

Via Zoom (session information will be e-mailed to subscribers)

### ABSTRACT

Suppose  $(X_1, \dots, X_n)$  are independent Bernoulli random variables with  $\mathbb{E}(X_i) = p_i$ , and we want to test the global null hypothesis that  $p_i = \frac{1}{2}$  for all  $i$ , versus the alternative that there is a sparse set of size  $s$  on which  $p_i \geq \frac{1}{2} + A$ . The detection boundary of this test in terms of  $(s, A)$  is well understood, both in the case when the signal is arbitrary, and when the signal is present in a segment.

We study the above questions when the Bernoullis are dependent, and the dependence is modeled by a graphical model (Ising model). In this case, contrary to what typically happens, dependence can allow detection of smaller signals than the independent case. This phenomenon happens over a wide range of graphs, for both arbitrary signals and segment signals.

This talk is based on joint work with Nabarun Deb, Rajarshi Mukherjee, and Ming Yuan.

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For further information and inquiries about building access for persons with disabilities, please contact Jonathan Rodriguez at 773.702.8333 or send him an email at [jgrodriquez@galton.uchicago.edu](mailto:jgrodriquez@galton.uchicago.edu). If you wish to subscribe to our email list, please visit the following website:  
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