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Towards Good Statistical Inference from Differentially
Private Data

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

ABSTRACT

Differential privacy (DP) brings provability and transparency to statistical disclosure limitation. When data users migrate their analysis to private data, there is no guarantee that a statistical model, otherwise good for non-private data, will still produce trustworthy conclusions. This talk contemplates two challenges faced by data users to draw good statistical inference from private data releases. When the DP mechanism is transparent, I discuss how approximate computation techniques (Monte Carlo EM, approximate Bayesian computation) can be systematically adapted to produce exact inference with respect to the joint specification of the intended model and the DP mechanism. In the presence of mandated invariants which the data curator must observe, I advocate for the congenial design of the DP mechanism via standard probabilistic conditioning on the invariant margins, as an alternative to optimization-based post-processing. This proposal preserves both the privacy guarantee of the output and its statistical intelligibility. A demonstration of restricted contingency table privatization is performed via a Markov chain algorithm.

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