



Local Privacy and Minimax Bounds: Sharp Rates for Probability Estimation

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We provide a detailed study of the estimation of probability distributions---discrete and continuous---in a stringent setting in which data is kept private even from the statistician. We give sharp minimax rates of convergence for estimation in these locally private settings, exhibiting fundamental tradeoffs between privacy and convergence rate, as well as providing tools to allow movement along the privacy-statistical efficiency continuum. One of the consequences of our results is that Warner's classical work on randomized response is an optimal way to perform survey sampling while maintaining privacy of the respondents.

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