An Introduction to Information Theoretic Minimax Lower Bounds

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When designing statistical estimators, we want to know how far our estimator is from the theoretical "best." Lower bounds help us answer this question by providing a guarantee of the form "no estimator that uses (some amount of information) to estimate (your quantity of interest) can have error lower than (some data-dependent quantity)." In this talk, we will describe Le Cam's method for proving minimax lower bounds on the risk of an estimator, using a reduction to two hypotheses. No prior knowledge of information theory or minimax lower bounds will be assumed.