Experimental Design in the Online Economy

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Abstract:

My talk will relate to the nature of data science and to the interface of data science and statistically designed experiments, my primary area of research.

The establishment of essential statistical principles for experimental design was one of the major accomplishments of Sir Ronald Fisher. His work was inspired by agricultural field trials. Although the modern world of online commerce seems light years removed from wheat and barley comparisons, those same principles remain as important as ever. My talk will review Fisher's fundamental insights and discuss their relevance to online experiments. Most of these experiments compare two formats for the web page, hence the common term "A/B" testing. They are used to compare possible changes to web pages with respect to outcomes like "click-through rate", "download rate" or "total sales". I will present modern methods for the design and analysis of online experiments with a focus on experiments that look simultaneously at a number of factors. Important features are to balance the need to explore and to exploit and to take advantage of the large traffic volume characteristic of most internet sites.

The work on online experiments is joint with Tamar Haizler.