

**MICHIGAN STATE UNIVERSITY**  
Department of Statistics and Probability

## COLLOQUIUM

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### Statistical Inference by Crowd-Sourcing

Tuesday, February 18, 2014  
10:20 a.m. - 11:10 am  
Refreshments 10:00 am  
C405 Wells Hall

**Abstract:**

Plots of data often provoke the response "is what we see really there". In this talk we will discuss ways to give visual statistical methods an inferential framework. Statistical significance of "graphical discoveries" is measured by having the human viewer compare the plot of the real dataset with collections of plots of null datasets: plots take on the role of test statistics, and human cognition the role of statistical tests, in a process modeled after the "lineup", popular from criminal legal procedures. This is a simple but rigorous protocol that provides valid inference, yielding p-values and estimates of the test power, for graphical findings.

Amazon's Mechanical Turk is used to implement the lineup protocol and crowd-source the inference. Turk is a resource where people are employed to do tasks that are difficult for a computer, in this case, evaluating structure in plots of data. With a suite of experiments, the lineup protocol was run head-to-head against the equivalent conventional test, yielding results that mirror those produced by classical inference. This talk will describe these results, and show how the lineup protocol is used for assessing graphical findings and designing good data plots.

(Joint work with Heike Hofmann, Mahbubul Majumder, Ninladri Roy Chowdhury, Lendie Follett, Susan Vanderploas, Adam Loy, Yifan Zhao)

*To request an interpreter or other accommodations for people with disabilities, please call the Department of Statistics and Probability at 517-355-9589.*