**ASA Workshop 2012**

Tetrad: Machine Learning and Graphical Causal Models

Session 1: Motivation and Representation

1. Motivation
2. Representing Causal Systems
   1. Causal Graphs
   2. Standard Parametric Models
      1. Bayes Nets
      2. Structural Equation Models
   3. Other Parametric Models
      1. Generalized SEMs
      2. Time Lag models
3. Estimation and Updating
   1. Estimation
   2. Updating

Session 2: Search

1. Causal Structure 🡨🡪 Testable Constraints
2. D-separation
3. The Object of Search: Equivalence Classes
   1. Patterns
   2. PAGs
4. Overview of Search
   1. Constraint Based Searches
   2. Scoring Based Searches
   3. Pointwise vs. Uniform Consistency/Reliability
5. Search in Tetrad
   1. Patterns: PC & GES
   2. Background Knowledge
   3. Estimating the Results of Search
   4. PAGs: FCI
   5. Variants (optional)
      1. CPC, CFCI, Lingam, etc.
   6. Doing Simulation Studies on the Tetrad Workbench (optional)

Session 3: Linear Latent Variable Models

1. Multiple Indicator Models
2. Pure-Measurement Models
3. Purify
4. MimBuild
5. Build Pure Clusters
6. Examples
   1. Barholomew – Anxiety
   2. Religious Coping

Session 4: fMRI

1. The Scientific Problem
2. The Data
3. iMages, etc.
4. Etc.