Jason Sauppe

Broad Interests:

- Theoretical Computer Science
  - Data structures and algorithms
- Operations Research
  - Optimization, Analytics

- The Science of Better
  http://www.scienceofbetter.org/
- INFORMS
  https://www.informs.org/About-INFORMS

$$\min \sum_{(i,j)\in A} c_{ij}x_{ij}$$

$$\text{s.t.} \sum_{j:(i,j)\in A} x_{ij} - \sum_{j:(j,i)\in A} x_{ji} = b_i \quad \forall i \in N$$

$$x_{ij} \geq l_{ij} \quad \forall (i,j) \in A$$

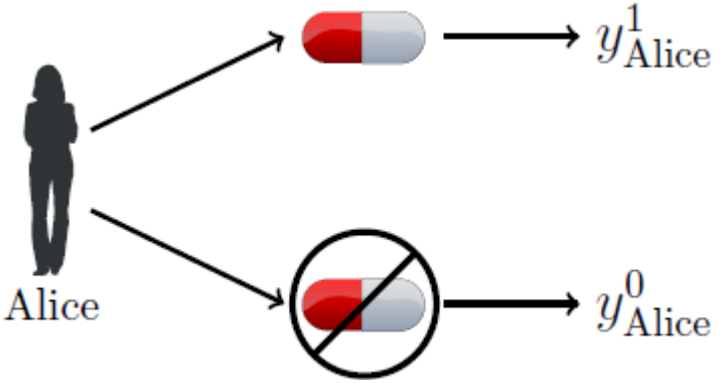
$$x_{ij} \leq u_{ij} \quad \forall (i,j) \in A$$

Past Projects

Election Analytics

http://electionanalytics.cs.illinois.edu

BOSS



$$\min \sum_{i \in \mathcal{P}} \sum_{j \in B_i} z_{ij}$$

$$\text{s.t.} \quad \sum_{c \in C} v_c = k$$

$$\left(\frac{1}{k} \sum_{c \in C \cap B_{ij}} v_c \right) - \frac{|T \cap B_{ij}|}{|T|} \leq z_{ij} \qquad \forall\, i \in \mathcal{P},\ j \in B_i$$

$$\frac{|T \cap B_{ij}|}{|T|} - \left(\frac{1}{k} \sum_{c \in C \cap B_{ij}} v_c \right) \leq z_{ij} \qquad \forall\, i \in \mathcal{P},\ j \in B_i$$

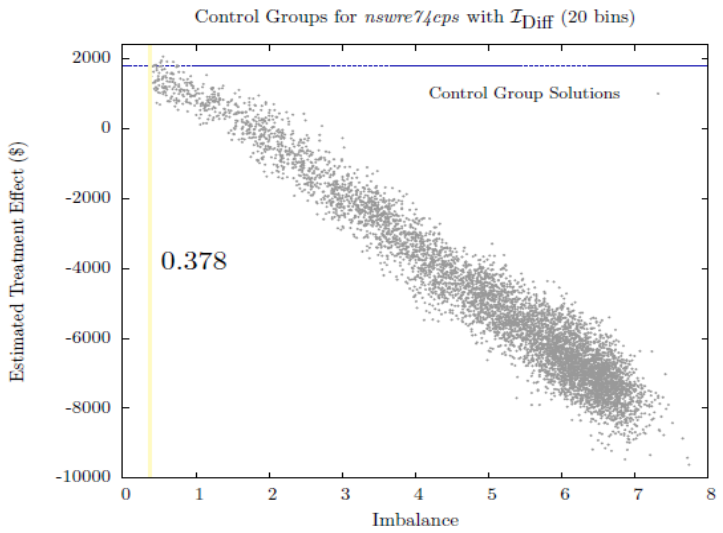
$$v_c \in \{0, 1\} \qquad \forall\, c \in C$$

$$z_{ij} \geq 0 \qquad \forall\, i \in \mathcal{P},\ j \in B_i$$

Future Research

BOSS Extensions

- Alternate Imbalance measures
- Optimizing over big datasets
- Multiple treatments



Applied Optimization

- Modeling
- Implementation
- Improving algorithms