Swiss Tournaments

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Motivation

- Tournament structure and design
- Do they work?

Swiss Tournaments

- Widely used, including chess and policy debate
- Random start + power matched rounds
- In debate: preseason tournaments identify top-k debaters
    - Reaching eliminations earns a bid for the postseason tournament

Do Swiss tournaments find the top-k competitors?

Simulation: Bradley-Terry

- Tournaments are sets of pairwise comparisons
- Assume each team has an underlying strength θ
    - Simulated using lognormal distribution
- Find winner by doing a random draw

$$\Pr(Y_{i,j} = 1) = \frac{\theta_i}{\theta_i + \theta_j}$$

Simulation: Pairings?

- 2 rounds of random pairings
- 4 rounds of power-matched pairings
- Teams cannot be paired with teams they've already faced
- Prefer teams with same # of wins, otherwise, max difference of 1

Simulation: Pairings!

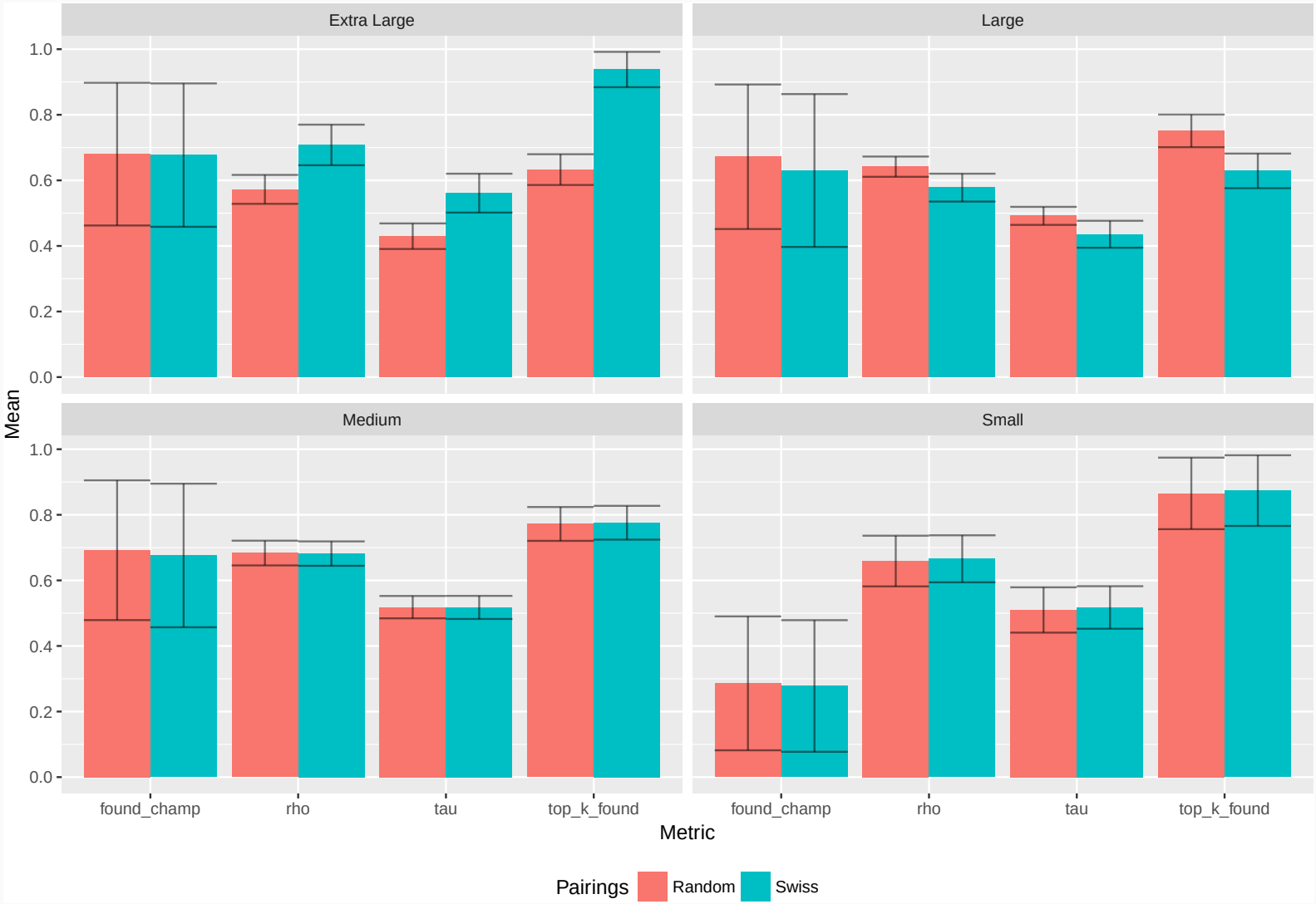
Maximum-weight perfect-matching

- Treat pairings as a graph problem
- Teams = nodes (n), possible pairings = edges (m)
- Complexity of $O(nm \log n) \sim O(n^3)$

Metrics

- Champion: Top-team is undefeated
- Top-k: Percent of the top-k teams by strength which meet selection criteria
- Spearman's ρ
- Kendalls τ

Results


Extra Large
Large
Medium
Small
Mean
1.0
0.8
0.6
0.4
0.2
0.0
found_champ
rho
tau
top_k_found
Metric
Pairings
Random
Swiss