A/B Testing in Dense Large-Scale Networks: Design and Inference
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**Network Effect in A/B Testing**

- All neighbors of a treated node are not receiving the same treatment as the treated node.

**Ego-cluster Experiment**

- Works under minimal assumptions.
- Does not work well for dense networks.

**Optimal Allocation Strategy (OAS)**

Randomly choose additional nodes to assign $C$.

\[ \sum \text{total exposure of the center node in } \partial \Delta \text{ and } \partial \Delta \text{ with respect to certain constraints controlling the risk of the experiment} \]

**Importance Sampling (IS)**

\[ \text{Response: } \{Y_1, \ldots, Y_n\} \text{ and } \{X_1, \ldots, X_n\} \]

**OAS Experiment**

1. Randomly assign $A$ and $B$.
2. Randomly choose additional nodes $X$.
3. Solve a constrained optimization to assign $C$ to $X$.
4. Run experiment and collect data.
5. Importance sampling correction.

**Network Effect in Exposure Redistribution Experiments**

- The total exposure mismatch can be cured by appropriately modifying the columns corresponding to some unassigned nodes.

**References**