Optimization for Deriving Bounds on non-Identified Causal Effects

# Work product

## Epidemiology paper describing the approach and R package

**Outline**

1. Overview of the problem
2. Description of the approach
   1. How it works (why it should be convincing)
   2. Limitations of application
3. Overview of the R package
   1. Novel contributions
   2. Functions
   3. Output
4. Examples of use and comparison with literature

## R package

**Critical features**

1. User specifies a graph, and an effect of interest. User specifies the “left-side” and “right-side” of the graph. Algorithm to apply Arvid’s criteria to specify the linear problem.
2. \*Clear\* documentation regarding the type of input, and what sorts of problems are solvable using the approach. Closely related to the paper.
3. Given 1, interface with the Balke program, find solutions, and output results in a sensible and useful manner.
4. Graphical representation of the graph and solution.

**Nice-to-have features**

1. Interactive interface that allows user to draw the graph.
2. Interactive ability to specify the “left-side” “right-side” portions of the graph
3. Algorithm to help determine whether a graph fits into the “left-side” “right-side” criteria