Syllabus

Course Description

This course introduces causal diagrams as tools for researchers who study the effects of treatments, exposures, and policies. The course focuses on translating expert knowledge into a causal diagram, drawing causal diagrams under different assumptions, and using causal diagrams to identify common biases and guide data analysis. The first part of the course introduces the theory of causal diagrams and describe its applications to causal inference. The second part of the course presents a series of case studies that highlight the practical applications of causal diagrams to real-world questions from the health and social sciences.

Course Outline

Lesson 1: Causal Diagrams

Lesson 2: Confounding

Lesson 3: Selection Bias

Lesson 4: Measurement Bias/ Putting it All Together

Lesson 5: Time-varying Treatments

Lesson 6: Causal SWIGs

Lesson 7: Building your DAG

Cases:

The Birth Weight Paradox with Dr. Allen Wilcox
Measurement Bias in Memory Loss with Dr. Maria Glymour
Confounding in Mediation Analysis with Dr. Tyler VanderWeele
Genes as Instrumental Variables with Dr. Sonja Swanson
The Obesity Paradox with Dr. Jay Kaufman

Certificate Requirements

To earn a certificate, the learner must earn a score of 70% or greater by the end of the course.

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Research Statement

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