STATISTICS
COLORADO STATE UNIVERSITY

Spring 2026 Departmental Seminar

Mary Meyer

Professor
Statistics
Colorado State University

Monday, May 4 , 2026 12:00 PM
Wagar Building Rm 232

Model Selection using Constrained Regression Splines

Abstract

Model selection is an important data analysis procedure for understanding phenomena and identifying relevant variables and relationships. Parametric assumptions about the regression functions, unless based on theory or a priori knowledge, are likely to lead to mis-specification errors. Practitioners are sometimes reluctant to turn to non-parametric models because the results might not be readily interpretable. The methods proposed here use shape-constrained splines and have the flexibility of non-parametric models while the shapes give meaning to the fits. For continuous predictors, we assume only that the components of the regression model are smooth and have a shape involving monotonicity and/or convexity, and the shapes as well as the variables are chosen through a model selection algorithm. The shapes clearly describe the relationships, and the model space is large enough to drastically reduce the risk of mis-specification, compared to parametric models. We derive an information criterion adapted to constrained splines, and prove consistency.