



EMR 2021
XVII Escola de Modelos de Regressão

RESUMOS DAS CONFERÊNCIAS

Conferência de Abertura: Regressão por componentes principais nos GAMLSS

Fernanda de Bastiani, UFPE, Brasil

Coordenadora da sessão: Audrey Helen Mariz de Aquino Cysneiros, UFPE, Brasil

Este trabalho fala sobre uma solução para o problema de ter que lidar com um grande número de variáveis explicativas inter-relacionadas dentro dos modelos aditivos generalizados de localização, escala e forma (GAMLSS). Um exemplo sobre o rendimento de títulos do governo grego-alemão de 25 de abril de 2005 a 31 de março de 2010 é apresentado. Foram anos financeiros turbulentos e, para captar o comportamento dos rendimentos, é necessário que um modelo seja capaz de lidar com a complexidade dos indicadores financeiros utilizados para prever os rendimentos. O ajuste de um modelo, por meio de regressão por componentes principais tanto para os termos principais, quanto para os de primeira ordem, para todos os parâmetros da distribuição estimada da variável resposta, parece produzir resultados promissores.

Conferência 2: Graphical modeling of risks in complex decision making

Tháís Fonseca, UFRJ, Brasil

Coordenadora da sessão: Kelly Gonçalves, UFRJ, Brasil

In ever-larger dynamic systems, it is increasingly difficult for decision-makers to effectively account for all the variables within the system that may influence the outcomes of interest under enactments of various candidate policies. Each of the influencing variables is likely to be dynamic sub-systems with expert domains supported by sophisticated probabilistic models. In this talk, I present a graphical modeling approach that decouples a large multivariate system into a sub-system of smaller dimensions and recouples the original system for prediction and decision making. Sequential and parallel



EMR 2021

XVII Escola de Modelos de Regressão

inference of model parameters allows for scalability for large data problems. In particular, I consider the problem of chronic food insecurity that represents one of the main obstacles to economical and social development in many countries. For instance, the food system is usually influenced by food prices, availability, income, unemployment, and demographic factors to cite a few. This work integrates historical data and expert knowledge within the framework of graphical models to allow for modeling and predicting food security over time. The model is based on Dynamic Bayesian Networks which are computational efficient providing fast risk evaluation for several competing policies. The case of continuous time series is illustrated by an application to food security in the UK at the household level which combines both economical, meteorological, and epidemiological data and expert information in a comprehensive model for malnutrition and school attainment. Finally, an extension to model food security in Brazil is presented which uses the PNAD data within a dynamical Bayesian Network model for discrete multivariate time series.

Keywords: Bayesian multi-agent models, causality, decision support, graphical models.
Joint with Martine J. Barons, Andy Davis, Jim Q. Smith and Luiz Eduardo S Gomes.

Conferência 3: Dimension Reduction and Variable Selection for High-Dimensional Multivariate Linear Regression

Narayanaswamy Balakrishnan - McMaster University, Canadá

Coordenador da sessão: Helton Saulo Bezerra dos Santos, UnB, Brasil

This talk will consist of two parts. In the first part, I will discuss reduced rank regression with matrix projections for high-dimensional multivariate linear regression, and present some technical results, simulation study and a case study illustrating the results and methods. In the second part of the talk, I will discuss envelope-based reduced rank regression for high-dimensional multivariate linear regression and present the corresponding results, and make some comparative comments with the first part.



EMR 2021
XVII Escola de Modelos de Regressão

Conferência 4: Efficient Estimation for Staggered Rollout Design

Pedro H. C. Sant'Anna - Microsoft, Estados Unidos

Coordenador da sessão: Helton Saulo Bezerra dos Santos, UnB, Brasil

This paper studies efficient estimation of causal effects when treatment is (quasi-) randomly rolled out to units at different points in time. We solve for the most efficient estimator in a class of estimators that nests two-way fixed effects models and other popular generalized difference-in-differences methods. A feasible plug-in version of the efficient estimator is asymptotically unbiased with efficiency (weakly) dominating that of existing approaches. We provide both t-based and permutation-test based methods for inference. We illustrate the performance of the plug-in efficient estimator in simulations and in an application to Wood et al. (2020a)'s study of the staggered rollout of a procedural justice training program for police officers. We find that confidence intervals based on the plug-in efficient estimator have good coverage and can be as much as five times shorter than confidence intervals based on existing state-of-the-art methods. As an empirical contribution of independent interest, our application provides the most precise estimates to date on the effectiveness of procedural justice training programs for police officers.

(Joint with Jonathan Roth)

Conferência 5: On the Blending of Statistical Machine Learning and Microeconomics

Michael I. Jordan - University of California, Berkeley, Estados Unidos

Coordenadora da sessão: Alexandra M. Schmidt, McGill University, Canadá

Statistical decisions are often given meaning in the context of other decisions, particularly when there are scarce resources to be shared. Managing such sharing is one of the classical goals of microeconomics, and it is given new relevance in the modern setting of large, human-focused datasets, and in data-analytic contexts such as classifiers and



recommendation systems. I'll discuss several recent projects that aim to explore the interface between machine learning and microeconomics, including the study of exploration-exploitation tradeoffs for bandit learning algorithms that compete over a scarce resource, leader/follower dynamics in strategic classification, and the robust learning of optimal auctions.