-Selecione o idioma-

Associação Brasileira de Estatística
XIV EBEB - Encontro Brasileiro de Estatística Bayesiana - Rio de Janeiro

(http://redeabe.org.br)

Scige

Apresentações em Pôster

Instruções para apresentadores:

- *O pôster devem ser afixado entre 15h20 e 16h40 do respectivo dia da apresentação e retirado ao término da sessão pôster*
- *As dimensões máximas de cada pôster devem ser de 90 cm de largura e 105 cm de altura*
- *O pôster deve estar preferencialmente em inglês*

Pôster 1 (Terça-feira)

1. **Título:** Bayesian Multivariate GARCH with Multiple Degrees of Freedom
Autores: Lassance, R.F.L.; Cerqueira, V.S.; Fonseca, T.C.O.
Abstract: Based on the BEKK model, presented in Engle and Kroner (1993), we propose a Bayesian process of estimation of the parameters, as well as some adaptations. This model has great merit, since it allows economists to verify the direct impact of a change in volatility in the mean vector. We include the possibility of using a fixed number of autoregressors and other covariates, considering 3 possible distributions for the data: multivariate normal, multivariate Student's t and a generalization – allowing for each univariate time series to have a different degree of freedom, while maintaining a covariance structure for the data vector. Since this model is proposed having applications in macroeconomics and finances in mind, having a different degree of freedom for each time series being analyzed is not only desired, it provides more flexibility while still using a well studied model in the literature. Through the use of simulations, we evaluate the consistency of the estimation and – following Fonseca, Ferreira and Migon (2008) – use a Jeffreys prior for the degree of freedom. Finally, we show an application using real data (exchange rates from multiple countries compared to the US Dollar (USD)), give final remarks and propose future works to further improve the model.
Keywords: *Time series; Multivariate GARCH; Generalized Student t; Jeffreys prior;*

major world economies. Therefore, it is proposed to use the method of copulas with fixed parameters of the elliptic and archimedean families, to analyze the degree of dependence between the Brazilian economy and four major world powers: United States, Japan, Germany and England for the period 2010 to 2017, in order to identify those that are more dependent on the Brazilian economy. The implemented models were the asymmetric and symmetric GARCH model for the marginal and normal copula, t-student, Gumbel, Frank, Clayton and Joe for the bivariate distribution. In terms of inference we adopt the Bayesian perspective and computationally intensive methods based on Monte Carlo simulations via Markov Chain (MCMC). Some interesting results of the co-movement between markets are discussed.
Keywords: *Copula-GARCH models; Markov Chain Monte Carlo; Dependece, Stock Markets;*

22. **Título:** Bayesian Option Pricing using Copula-GARCH model
Autores: Lucas Pereira Lopes; Vicente Garibay Cancho
Abstract: An option is a financial derivative that gives the right, but not the obligation, of the investor to exercise the purchase or sale of an asset at a given time and for a certain price. There are several consolidated pricing models in the financial literature, however, they impose some restrictions, such as constant volatility and normal multivariate distribution for the underlying assets. Based on modern finance theory, such assumptions are not valid. Therefore, the objective of this work was to develop a financial options pricing model via the GARCH-copula model, where the underlying assets of the options will be modeled via GARCH and the necessary dependency structure for the pricing will be modeled by the copulas functions. In terms of inference we adopt the Bayesian perspective and computationally intensive methods based on Monte Carlo simulations via Markov Chain (MCMC). The method will be applied considering symmetric and asymmetric GARCH, archimedean and elliptic copulas, using Brazilian stock data. The advantage of this method is that the stock volatilities are dynamically captured and copula provides all information about the joint distribution of the underlying assets of the option.
Keywords: *Copula-GARCH models; Markov Chain Monte Carlo; Option Pricing;*

23. **Título:** Bayesian Restoration of Audio Signals Degraded by Low-Frequency Decaying Pulses
Autores: Hugo Tremonte de Carvalho; Flávio Rainho Ávila; Ralph dos Santos SIlva; Luiz Wagner Pereira Biscainho
Abstract: The study of techniques to perform audio restoration can be motivated in several ways: for example, a collection of old recordings that are physically damaged may contain important information about the musical memory of some country or region; or if some audio of a crime scene in a noisy environment is available, it will be necessary to remove the degradation in order to find out what happened at that moment. Unfortunately there is no available algorithm that restores a recording possessing any kind of degradation, and we must tackle the possible present defects separately. In this work we consider the situation where the recording is corrupted with long pulses, that are the response of the needle-arm set of a playback device when reproducing a deeply scratched or even broken disk or cylinder recording. We propose here a parametric and non-parametric model for this degradation, the latter being described as a Gaussian Process. Following the current literature, we impose an AR model for the original signal we wish to recover, and using adequate prior distributions for the model of the pulse, we perform a bayesian estimation of the degradation, and therefore, of the original signal, via the Gibbs Sampler. A missing point of the previously proposed techniques to solve this problem was an efficient initialization procedure: since this degradation does not corrupt the whole signal, it is important to automatically locate where the defect is present. We also propose an efficient method for locating the defect, based on a time-frequency analysis.
Keywords: *audio restoration; time-frequency analysis; statistical signal processing; bayesian statistics; gaussian process;*

24. **Título:** Bayesian Statistical Learning Applied to Text Mining
Autores: Lobo Vianna, B.; Damiani, A.P.; Trecenti, J.; Fossaluza, V.
Abstract: Statistical learning is one of the most trendy terms today. With the growing availability of online information, text mining has gained a lot of strength in analyzing data coming from the web. Most statistical learning methods can be formalized under the context of Bayesian inference. In this study, we will analyze a text which is a sequence of collective work agreements, in order to predict the existence of health assistance. These Hypertext

Markup Language (HTML) documents have a predefined structure, with a title and a description of the different types of benefits (such as food, health and retirement). After separating each agreement into subgroups and concatenating those titles into a single string, we will build a predictive model using convolutional neural networks in one dimension under the Bayesian approach to statistical learning, in order to associate each agreement with the existence indicator of health assistance (1 when the contract covers health aid, 0 when it doesn't). This method was chosen for being flexible in its hipotesis of structure and observation. It also has shown a great power to find relations in the words and text sequencies without human intervention, and there is no need to explicitly build a keyword dictionary. In this paper, we will present a solution to the problem under the Bayesian approach to statistical learning.
Keywords: *Bayesian Inference; Statistical Learning; Neural Networks; Text Mining;*

25. **Título:** Bayesian cross-validation of geostatistical models
Autores: Viviana das Graças Ribeiro Lobo; Thaís Cristina Oliveira da Fonseca; Fernando Antônio da Silva Moura
Abstract: The problem of validating or criticising models for georeferenced data is challenging, since the conclusions can vary significantly depending on the locations of the validation set. This work proposes the use of cross-validation techniques to assess the goodness of fit of spatial models in different regions of the spatial domain to account for uncertainty in the choice of the validation sets. An obvious problem with the basic cross-validation scheme is that it is based on selecting only a few out of sample locations to validate the model, possibily making the conclusions sensitive to which partition of the data into training and validation cases is utilized. A possible solution to this issue would be to consider all possible configurations of data divided into training and validation observations. From a Bayesian point of view, this could be computationally demanding, as estimation of parameters usually requires Monte Carlo Markov Chain methods. To deal with this problem, we propose the use of estimated discrepancy functions considering all configurations of data partition in a computationally efficient manner based on sampling importance resampling. In particular, we consider uncertainty in the locations by assigning a prior distribution to them. Furthermore, we propose a stratified cross-validation scheme to take into account spatial heterogeneity, reducing the total variance of estimated predictive discrepancy measures considered for model assessment. We illustrate the advantages of our proposal with simulated examples of homogeneous and inhomogeneous spatial processes to investigate the effects of our proposal in scenarios of preferential sampling designs. The methods are illustrated with an application to a rainfall dataset.
Keywords: *Spatial processes; Data partition; Model criticism; Discrepancy function; Importance sampling;*

26. **Título:** Bayesian finite mixture modeling based on scale mixtures of univariate and multivariate skew-normal distributions
Autores: Marcus Gerardus Lavagnole Nascimento; Carlos Antonio Abanto-Valle; Victor Hugo Lachos Dávila
Abstract: In this work, finite mixtures of scale mixtures of skew-normal (FM-SMSN) distributions are introduced to deal simultaneously with asymmetric behavior and heterogeneity present in some data sets. A Bayesian methodology based on the data augmentation principle is derived and an efficient Markov-chain Monte Carlo (MCMC) algorithm is developed. These procedures are discussed with emphasis on finite mixtures of skew-normal, skew-t and skew-slash distributions for both univariate as well as multivariate case. Univariate and bivariate data sets using FM-SMSN distributions are analyzed. According to the results FM-SMSN distributions support both data sets.
Keywords: *Bayesian inference; finite mixture; scale mixture of normal distributions; Markov chain Monte Carlo.;*

27. **Título:** Bayesian modelling and allocation of insurance risks
Autores: Rodrigo S. Targino; Gareth W. Peters; Mario V. Wuthrich
Abstract: In this talk I will present a fully Bayesian model for actuarial claims reserving consistent with the guidelines provided by the Swiss Solvency Test, the Swiss regulatory directive. This model is, then, used to compute the company’s overall actuarial reserve, which, in a second stage, must be allocated to its individual lines of business. To compute the quantities involved in the process of allocation of capital to sub-units I will present a recently developed algorithm based on (pseudo-marginal) Sequential Monte Carlo methods.
Keywords: *Sequential Monte Carlo (SMC); Solvency Capital Requirement (SCR); Swiss Solvency Test (SST);*