2nd GAS Workshop

Workshop on Generalized Autoregressive Score Models

VENUE: IME-USP, Auditório Antonio Gilioli (bloco A, sala 247)
DATE: April 16-18, 2015
REGISTRATION FEE: Free

OBJECTIVE:

This workshop aims to bring together researchers with an interest in Generalized Autoregressive Score (GAS) models to discuss new ideas and statistical techniques along this area of expertise.

ORGANIZATION:

- IME-USP and Graduate Program of Statistics (MAE);
- Risk Assessment Group at CEPID-CeMEAI;
- Projeto Temático: "Séries temporais, ondaletas e análise de dados funcionais".

WORKSHOP PROGRAMME:

Thursday 16/04/2015

10:30 – 12:00 Cristiano Fernandes (PUC-Rio)
        Introduction to GAS Models (Tutorial, Part 1)
12:00 – 14:00 Lunch
14:00 – 15:30 **Introduction to GAS Models (Tutorial, Part 2)**
15:30 – 16:30 Flavio Zingelmann (UFRGS)
        From Dynamic Vine Copula to Dynamic Factor Models
16:30 – 18:00 **Round Table**

Friday 17/05/2015

10:00 – 12:00 Leandro Ferreira and Rafael Aguilera (IME-USP)
        Introduction to Copulas and Applications
12:00 – 14:00 Lunch
14:00 – 15:30 Nikolai Kolev (IME-USP)
        Time-invariant Copulas in GAS Models
15:30 – 16:30 Marinho de Andrade (ICMC-USP)
16:30 – 18:00 **Round Table**

Saturday 18/05/2015

09:00 – 12:00 **Discussion on Hazard Version of GAS Models**

Conference 1: Introduction to GAS Models (Tutorial)
Cristiano Fernandes (PUC-Rio)

Abstract: In this tutorial we will discuss a newly proposed framework for the development of time series models with time varying parameters: the Generalized Autoregressive score models or GAS models of Creal, Koopman and Lucas (2013). We will point out the similarities and differences between GAS models and other proposed models with time varying parameters, such as GARCH models (a very special case of a GAS model) and state space models. We will also highlight some of the advantages of using GAS models when dealing with non Gaussian time series, tackling some important issues of practical concern when implementing these models. The GAS framework is illustrated trough applications in Energy, where wind speed and hydro inflow time series have to be predicted several months ahead.

Conference 2: From Dynamic Vine Copula to Dynamic Factor Models
Flavio Zingelmann (UFRGS)

Abstract: Vine copulas constitute a very flexible class of multivariate dependence models. Built on bivariate copulas, they can match any possible dependence structure. We propose an approach that allows the dependence parameters of the pair-copulas in a D-vine decomposition to be potentially time varying. As an illustration, we risk measures, such as Value at Risk and Expected Shortfall for large dimensional portfolios via copula modelling. For that we compare several high dimensional copula models, from naive ones to complex factor copulas, which are able to tackle the curse of dimensionality whereas simultaneously introducing a high level of complexity into the model.

Short course: Introduction to Copulas and Applications
Leandro Ferreira and Rafael Aguilera (IME-USP)

Abstract: We will present basic copula concepts and families, measures of dependence, inference procedures and copula time-series applications.

Conference 3: Time-invariant Copulas in GAS Models
Nikolai Kolev (IME-USP)

Abstract: An implicit assumption of many analyses is that the dependence structure between the error terms in individual time-series is (roughly) constant in time, i.e. the corresponding copula should be time-invariant (static). But, it is well-known that the only time-invariant absolutely continuous copula is Clayton's one (exhibiting lower tail dependence).

The time invariance is not a common copula property and depends on the additional (and appropriate) utility criteria to be applied. We suggest to use the Sibuya class of copulas incorporating many known copula families which represent multivariate distributions preserving the Sibuya dependence function (being the ratio of joint distribution to the product of marginals) with respect to the residual life-time vector.

Conference 4: To be announced
Marinho de Andrade (ICMC-USP)