INVITATION

The Department of Mathematics and Statistics of the
University of Cyprus invites you to the

4th Probability and Statistics Seminar Series

Speakers:

Professor Michael H. Neumman, (Department of Statistics, Friedrich-Schiller-Universitat Jena)
Professor Paul Embrechts, (Department of Mathematics and RiskLab, ETH Zurich)
Professor Markus Reiss, (Institute for Applied Mathematics, Universitat Heidelberg, Germany)
Professor Shaul Bar-Lev, (Department of Statistics, University of Haifa, Israel)

Professor Michael H. Neumman

(Department of Statistics, Friedrich-Schiller-Universitat Jena)

"Dependence in Probability and Statistics"

Friday, 12th September 2008, 16:30-18:30
Room 039

Abstract:

Independence of random variables is an important assumption for classical results in probability and statistics. On the other hand, when data from time series are encountered, such an assumption is often unrealistic. In order to obtain meaningful results, however, certain assumptions which exclude a too strong dependence have to be imposed.

I will first review classical concepts of restricting dependence between random variables. It turns out that these concepts allow similar tools to be used as in the independent case. On the other hand, some time series models which are of interest in statistics do not satisfy any of these conditions. Doukhan and Louhichi (1999) introduced a new concept called weak dependence which is actually weak enough to be fulfilled by almost all time series models but still strong enough to make meaningful results possible.
I will introduce this new notion, discuss its applicability and show which tools are now available under such an assumption.

UNIVERSITY OF CYPRUS
DEPARTMENT OF MATHEMATICS AND STATISTICS

Professor Paul Embrechts

(Department of Mathematics and RiskLab, ETH Zurich)

"Statistics and Quantitative Risk Management"

Friday, 10th October 2008, 16:30-18:30
Room 039

Abstract:
An overview will be given of the qualitative regulatory guidelines in use within Quantitative Risk Management (QRM) for the financial industry. Special attention will be given to the estimation of extremal events within QRM: high quantile estimation (Value-at-Risk), the modelling of extreme tail dependence . In particular, I shall discuss the current subprime crisis from a statistical modelling point of view and highlight some relevant current statistical research topics within QRM.

UNIVERSITY OF CYPRUS
DEPARTMENT OF MATHEMATICS AND STATISTICS

Professor Markus Reiss

(Institute for Applied Mathematics, Universitat Heidelberg,Germany)

" Wavelet methods in statistical inverse problems"

Friday, 7th November 2008, 16:30-18:30
Room 039

Abstract:
Statistical inverse problems arise always when the function of interest is not observed directly, but in some transformed way and under noise. We shall introduce linear inverse problems in an abstract framework and discuss briefly applications like tomography, deconvolution and calibration of financial models. To solve inverse problems, we face three tasks: (a) denoising, (b) inverting the transform and (c) regularizing the inversion (which is usually not stable).

For these tasks wavelet methods are attractive because they have excellent properties in approximating wide classes of functions and operators. Moreover, they allow for thresholding algorithms which lead to adaptive and sparse solutions. We shall discuss these Wavelet-Galerkin procedures in detail and show how the solutions adapt to spatial inhomogeneity, expressed in terms of Besov spaces. In addition, we shall discuss the case where also the transformation (the operator) is not known exactly and a new operator thresholding procedure will be introduced. The interplay between the noise in the operator and in the data is considered in detail. Simulation results will illustrate the results.

Professor Shaul K. Bar-Lev

(Department of Statistics, University of Haifa, Israel)

"Group Testing Procedures with Incomplete Identification and Their Applications in Medical and Industrial Problems"

Friday, 14th November 2008, 13:00-15:00
Room 039

Abstract:

In this talk we review an ongoing research project on group testing procedures jointly with Wolfgang Stadje (Osnabrück, Germany), Frank van der Duyn Schouten (Tilburg, the Netherlands) and Onno Boxma (EURANDOM, Eindhoven, Netherlands). This project has already yielded several research papers:

1. "Hypergeometric group testing with incomplete information" (2003)
2. "Optimal group testing with processing times and incomplete identification" (2004)
3. "Multinomial group testing models with incomplete identification" (2005)
4. "Group testing procedures with incomplete identification and unreliable results" (2006);
5. "Applications of bulk queues to group testing models with incomplete identification" (2007);
6. "A Two-Stage Group Testing Model for Infections with Window Periods" (To appear).
7. "Group Testing Procedures with Quantitative Features and Incomplete Identification" (in preparation).
8. "Queues in Tandem with Batches and Impatient Customers for Blood Screening Associated with ELISA and PCR Testing Procedures" (in preparation).

More specifically we review various types of group testing models. The objective is to choose an optimal group size for pooled screening of a contaminated population so as to collect a prespecified number of good items from it with minimum testing expenditures. The tested groups that are found contaminated are either discarded or are used as new sampling population in later stages of the testing procedure. Since testing may be time consuming, we also consider deadlines to be met for the testing process. we derive algorithms and obtain exact results for the underlying distributions of the associated stopping times, enabling us to find optimal procedures. We shall briefly review various aspects of group testing procedures such as multinomial group testing; unreliable results (false-positive and false-negative), window periods and expiration dates.

The talk will not be of any mathematical nature but rather a brief "state of art" on the subject.