

Probability Mini-Conference:

Friday, 4 November 2011

We are delighted to announce that a "micro-conference" on Probability Theory & Its Applications, proudly supported by MASCOS, will be held at the University of Melbourne on the afternoon of Friday 4 November. There will be four 30+5min talks, to be followed by a dinner.

RSVP for catering purposes by 12:00 noon on Friday, 28 October 2011 to kostya.borovkov@gmail.com. Please also indicate whether you will be joining us for dinner (planned to start around 6:45pm, at a local restaurant -- most likely, an Italian place @ Lygon Street, Carlton). Partners more than welcome.

+++++ **PROGRAM** +++++

(Please scroll down for abstracts of the talks)

Venue: Old Geology Theatre 1, Parkville Campus, Melbourne Uni

** 3:20-3:50pm [3:55 end of question time]

Talk 1: Evaluation of ruin probability by simulations

Speaker: Fima Klebaner (Monash Uni)

** 3:55-4:25pm [4:30 end of question time]

Talk 2: On Stationary Distributions of Neuron Networks

Speaker: Geoffrey Decrouez (Melbourne Uni)

**4:30-5:00pm

Tea/coffee break (tearoom, Richard Berry Bldg)

** 5:00-5:30pm [5:35 end of question time]

Talk 3: Control of connected Markov chains: Application to congestion avoidance in the Internet and to the dams management.

Speaker: Boris Miller (Monash Uni)

** 5:35-6:05pm [6:10 end of question time]

Talk 4: On the Uniform Law for Sojourn Times

Speaker: Shaun McKinlay (Melbourne Uni)

** 6:45pm +

Dinner (venue TBA)

+++++

APPENDIX: Abstracts of the talks

Talk 1: Evaluation of ruin probability by simulations

Speaker: Fima Klebaner (Monash Uni)

Abstract: We consider evaluation of ruin probability in the Constant Elasticity of variance Model by simulations (Euler-Maruyama scheme). While we show weak convergence in the Skorohod space, the ruin probability evaluated by simulations is not guaranteed to converge, because the limiting distribution is discontinuous at zero. However, it can be approximated using the Levy metric, and this is confirmed numerically. We also show that convergence takes place after some modification to the scheme is made.

The talk is based on the papers:

- * Abramov, Klebaner and Liptser, "The Euler-Maruyama approximations for the CEV model", Discrete and Continuous Dynamical Systems, Series B, Vol. 16, 1, 2011 pp. 1--14, and
- * Chigansky and Klebaner, "The Euler-Maruyama approximation and the absorption times" (submitted).

Talk 2: On Stationary Distributions of Neuron Networks

Speaker: Geoffrey Decrouez (Melbourne Uni)

Abstract: We present a stochastic network model for real-life neuron networks that takes into account Hebbian learning. The system can be represented by a Markov process whose state space is an infinite hierarchy of finite-dimensional simplices. Under broad assumptions, the process is shown to be ergodic and have a continuously differentiable density w.r.t. the sum of Lebesgue measures of the simplices. We also demonstrate that the stationary distribution of the network can be approximated by a finite-dimensional one corresponding to a similar Markov process on a truncated version of the state space and that the convergence rate is super-exponential rate. [Joint work with Kostya Borovkov and Matthieu Gilson.]

Talk 3: Control of connected Markov chains: Application to congestion avoidance in the Internet and to the dams management.

Speaker: Boris Miller (Monash Uni)

Abstract: The article considers the optimal control for the system of finite number of controlled connected Markov chains (CMC). Such models come from queuing systems with many service lines and/or from the control of resources of multiple connected dams. The state of such CMC is represented as a tensor of the depth d , where d is the number of controlled chains. This tensor form is much more convenient for derivation of the dynamic programming equation. We give a tensor form for the control problems arising in the router control which is aimed to the congestion avoidance with the aid of two telecommunication

lines having different properties and cost of services. We also consider the problem of connected dams' management. [Joint work with Alexander Miller and Daniel McInnes.]

Talk 4: On the Uniform Law for Sojourn Times

Speaker: Shaun McKinlay (Melbourne Uni)

Abstract: The uniform law for the positive sojourn time of Brownian bridge on $[0,1]$ has been extended in recent years to Lévy bridges and processes with exchangeable increments. More recently, it has been shown (with some conditions) to be a property of processes with cyclically exchangeable increments (CEI) and has been extended to any stationary measurable process on the positive half line. We will show that CEI processes on $[0,1]$ satisfy the uniform law for sojourn times, and present an extension to general index sets. [Joint work with Kostya Borovkov.]