

# EURANDOM NEWSLETTER

## Volume VI, Issue 1, January 2004

(the previous letter was from June 2003)

### General

The year of our first lustrum, 2003, was a good year for EURANDOM. We had a research staff of approximately 27 postdocs and PhD students, we organised 12 workshops, co-organised one workshop in Hungary and organised the Thomas Stieltjes Institute afternoon and had over 40 visitors. The number of EURANDOM reports (pre-prints) is 45.

Furthermore, we received from NWO and TU/e funding for 2004-2007.

Eleven postdocs and PhD students were financed through additional funds: Six postdocs were supported by the Marie Curie Fellowship programme, NSF, FOM, TU/e-mathematics department, TU/e department of Technology Management and NWO respectively; five postdocs were funded through industry grants.

Our five-year existence and start of a new funding period led us to take a fresh look at our research programmes. Discussions started in October 2002 and were continued June 2003 with our Board and Scientific Council, led to the decision to realign our research. From summer 2004 onwards EURANDOM research will be organised in three programmes, each with three themes:

\*Random Spatial Structures: Critical Phenomena; Disordered Systems; Combinatorial Probability

\*Stochastic Networks: Performance analysis of Production Systems; Modelling and Analysis of Mobile Communication Systems; Queuing Theory

\*Mathematical Statistics: Statistical Learning; Biomedical and Bio-molecular Statistics; Industrial Statistics.

*All these names are working titles.*

Next to these it will be possible to support projects (i.e. new initiatives). One such project, currently running is on re-insurance. The project on Battery modelling is an example of a project, based on more than one of the above-mentioned programmes

Within the 6<sup>th</sup> Framework Programme, we were successful as participant in the PASCAL Network of Excellence on Pattern Analysis and Computational

Learning, and we participated in a proposal for an Integrated Project BITOPIA-FUGE, which objective it is to provide a comprehensive bioinformatics software suite for optimal integration of computational analysis and prediction techniques for sequence, expression and functional genomics data, in order to streamline and accelerate biotechnological, pharmaceutical and medical discovery projects.

The ESF scientific programme RDES, which is chaired by EURANDOM, continued its activities in 2003 with exchange of visitors and the organisation of workshops throughout Europe.

Also with the OTKA/NWO collaborative programme on Patteren Dynamics of Spatially Extended Systems, we were active. A very successful workshop was organised in the summer in Budapest and several Hungarian colleagues visited EURANDOM.

We continued our "networking" activities in the framework of the EC Thematic Network Pro-Enbis by participating in activities of the partners and by organising a Data mining workshop.



*Scientific meetings social events during the Alumni days*

The idea to further strengthen the international contacts with the help of a EURANDOM Alumni network was implemented with a first meeting on January 9 and 10, 2004.

## People

Professor **Pieter Zandbergen** stepped down as chair of the board of EURANDOM on January 1, 2004. As his successor is nominated Dr **Jo Ritzen**.

In the framework of the NWO-Stochastic Analysis grant, dr. **Bas Lemmens** completed his research at EURANDOM and applied successfully for a NWO TALENT grant to continue his research for one year in Berlin.

Dr. **Fabio Toninelli** received several invitations and travel grants for cooperative research in France, Italy and Switzerland.

Dr. **Nicola Armstrong** applied successfully for an ESF visitor grant for working at the Max Planck Institute for Molecular Genetics in Berlin (October-December 2003). She became acquainted with sequence analysis methods and started collaboration with the host on statistical methods for the identification of binding sites.

Dr. **Krishanu Maulik** was invited to visit SAMSI, US and participate in a workshop, for six weeks (September 15 – October 26, 2003).

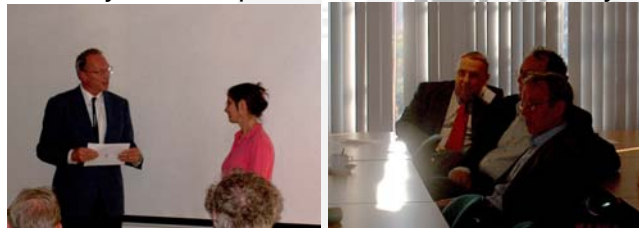
**Talia Figarella** won one of the three prizes for best PhD presentation at the ENBIS-ISIS.

Dr. **Federico Camia** received a Marie Curie Fellowship; we are awaiting the contract.

Dr. **Remco van der Hofstad**, TU/e and EURANDOM was awarded a VIDJ grant from NWO.

Dr. **Christian Gromoll** ended his Marie Curie Fellowship, and continues his research on a NSF grant.

During the Stieltjes Afternoon the Stieltjes Prize for the student with the best Ph.D. was awarded to **dr. Nelly Litvak**, former researcher at EURANDOM, currently assistant professor at Twente University.



*Awarding of the Stieltjes Prize*

Professor **Aad van der Vaart** (SIM) and professor **Mike Keane** (ISS) stepped down as scientific advisors; dr. **Ivo Adan** (SN) and dr. **Remco van der Hofstad** (ISS) started as scientific advisors on January 1, 2004.

Dr. **Andrei Sleptchenko** started in December with a project on logistics in cooperation with the department of Technology Management (TM).

**Dmitri Znamenski** defended his PhD thesis at the VU Amsterdam in October 2003 and started a postdoc position granted by NWO "Statistical Analysis of Internet Data" supervised by Remco van der Hofstad (TU/e and EURANDOM) and by Gerard Hooghiemstra and Piet van Mieghem (TU Delft).

## People who left

July: Bojan Basrak (Croatia);  
August: Jyri Lember (Estonia), Arnaud Le Ny (France);

September: Nino Mushkudiani (Georgia), Bas Lemmens (The Netherlands), Sonia Hernandez Alonso (Spain), Patrick Lindsey (Belgium);

November: Tao Lin (China);  
December: Juan-Carlos Rodriguez (Argentina), Madalin Guta (Romania).

## New people

SIM: Iryna Snihir (Russia) - September  
SIM: Wicher Bergsma (The Netherlands) - September  
SN: Dmitri Znamenski (Russia) - October  
SN: Nidhi Hegde (Canada) - January  
ISS: Karel Netocny (Czechia) – November  
Gregory Maillard from France - February  
CMB: Nadia Lalam from France - February

## People who arrive soon

ISS: Anne Fey (The Netherlands) - March  
Re-insurance: Michel Verschuere (Belgium) - 1 week per month starting in June.

## Visitors July - December 2003

In September-November 2003 EURANDOM hosted, the **Stieltjes Visiting Professor**, Prof. G. Slade, University of British Columbia, Canada (September 6-November 29). He gave a lecture series on The lace expansion and its applications, a lecture during the Stieltjes Afternoon on October 16, 2003 and visited several Dutch Universities



Lectures during the Stieltjes Afternoon

## ISS

K. Simon (Technical University Budapest, HU); M. Holmes (University of British Columbia, CA); A. Telcs (CEU Graduate School of Business, HU); A. Greven (Friedrich-Alexander-Universität Erlangen-Nürnberg, D); B. Hughes (University of Melbourne, AU); T. Hara (Nagoya University, Japan); J. Gärtner (Technische Universität Berlin, D); M. Gordin (Steklov Institute, Saint Petersburg, Ru); K. Simon (Technical University Budapest, HU); W. König (TU Berlin, D).

## FS / SERA

R. Brummelhuis (University of London, UK); J. Collet (Université de Reims, F); H. Geman (Université Paris Dauphine, F).

## SIM

D. Herrmann (The Bosch Group).

## SN

D. Perry (University of Haifa, IL); O. Kella (Hebrew University of Jerusalem, IL); H. Levy (Tel Aviv University, IL).



Christmas dinner (December 18, 2003)

## Guests in 2004:

EURANDOM  
PO Box 513  
5600 MB Eindhoven  
The Netherlands

SN: D. Down (Mc Master University, Hamilton, Canada) arrived in January and will stay for 6 months –

ISS: C. Külske (WIAS Berlin, Germany) arrived in February, also for half a year.

Furthermore

January:

P. Taylor and V. Kulkarni (SN), J. Lember (SIM), A. Toom (ISS), L. Accardi (SIM),

February: J. Gärtner, G. Krupa, E. Baake (all ISS), R. WU (SN)

March: A. Asselah (ISS)

April: F. Morlot (SN)

May: S. Wittington (ISS).

## Workshops June - December 2003

**SN** - September 8-11

Heavy Traffic Analysis and Process Limits of Stochastic Networks, co-sponsored by NOW: 50 participants

**SERA** - September 18 & 19

Statistical Issues in Actuarial Risk Modelling: Dependence Modelling and Detrending, Aon Re Europe Science Team Meeting: 28 participants

**Stieltjes Afternoon** - October 16

35 participants

**ISS** - December 8-10

Gibbs vs. non-Gibbs in Statistical Mechanics and related fields, co-sponsored by the ESF/RDSES network; 30 participants

**Alumni days** - January 9 and 10

25 participants

## Upcoming EURANDOM workshops:

**ISS**

Meeting of the Dutch-German Bilateral Research Group on Stochastic Models from Physics and Biology –BRG-, February 23 and 24

Young European Probabilists -YEP- "Conformal invariance, scaling limits and percolation"; March 29 to April 2, 2004

**SERA**

Exotic option pricing under advance Lévy models; May 3 & 4, 2004

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## SIM

mODa 7 - June 14-18, 2004

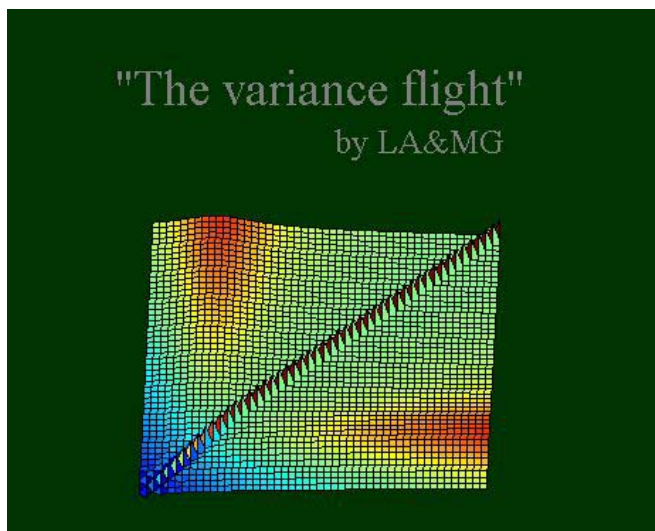
obtain bounds that are used to prove consistency results of a proposed Pattern Function Projection estimator.

(For more information on this subject, see [An invitation to quantum tomography](#) EURANDOM report 2003 05 and "An invitation to quantum tomography -II" - soon to be published-2003 45)

## An example of the research

### "The variance flight"

by Luis Artiles and Madalin Guta



(Click on the picture to get the animation)

Estimating the quantum state of light is a problem of Optical Physics where one is interested in finding a good approximation for the density matrix of the quantum state. Quantum Homodyne Tomography (QHT) is an experimental technique, already implemented in laboratories, providing data to accomplish such a task. Statistically this is an inverse problem very similar to problems of Medical Imaging, in particular, Positron Emission Tomography. One of the possible estimators to use, based on the data, is the so-called Pattern Function (PF) estimator. The point-wise variance of such an estimator depends on the underlying quantum state. From simulated data we have computed the variance of the PF estimator for different coherent states, where we have varied the photon number parameter. In this way we have obtained the above animation, which shows features of the variance matrices. We have studied such features in order to

*For an overview of activities, people, EURANDOM reports etc. see*

[http://www.eurandom.tue.nl/seminars\\_and\\_workshops.htm](http://www.eurandom.tue.nl/seminars_and_workshops.htm) - Today

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<http://www.eurandom.tue.nl/people.html>

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