

PROGRAM

0-1 Matrix Theory and Related Topics

June 17-19, 2010

Department of Mathematics

University of Coimbra

Portugal

Sponsored by:

The American Mathematical Society – AMS

The International Linear Algebra Society – ILAS

Fundação para a Ciência e a Tecnologia – FCT

Centre for Mathematics, University of Coimbra – CMUC

Department of Mathematics, University of Coimbra – DMUC

Luso-American Development Foundation – FLAD

Thursday - June 17, 2010

Room *Pedro Nunes*

08.30 – 09.00 Registration

09.00 – 09.15 Opening Ceremony

Chair: Natália Bebiano

09.15 – 10.00 Plenary Session

Asymptotic enumeration of 0-1 matrices: the sparse case

Catherine Greenhill

University of New South Wales, Sydney, Australia

10.00 – 10.45 Plenary Session

Asymptotic enumeration of 0-1 matrices: the dense case

Brendan McKay

Australian National University, Canberra, Australia

10.45 – 11.15 Coffee Break

Chair: Alexander Barvinok

11.15 – 12.00 Plenary Session

Unbiased Hadamard matrices

Hadi Kharaghani

University of Lethbridge, Lethbridge, Alberta, Canada

12.00 – 12.45 Plenary Session

Bounds on the largest families of subsets with forbidden subposets

Gyula O.H. Katona

Alfréd Rényi Institute of Mathematics, Budapest, Hungary

12.45 – 14.15 Lunch

Chair: Carlos Fonseca

14.15 – 15.00 Plenary Session – ILAS Lecture

Some threads of the theory of 0-1 matrices in graphs and combinatorics

Herbert Wilf

Thomas A. Scott Emeritus Professor of Mathematics
University of Pennsylvania, USA

15.10 – 16.20 Contributed Talks – Parallel Sessions

16.20 – 16.40 Coffee Break

16.40 – 17.55 Contributed Talks – Parallel Sessions

Contributed Talks

Room *Pedro Nunes*

Chair: Geir Dahl

- 15.10 – 15.30 *Natural realizations of sparsity matroids*
Ileana Streinu, Smith College, USA
- 15.35 – 15.55 *On the determinant of cocyclic $(-1,1)$ -matrices over D_{4t}*
José Andrés Armario-Sampalo, Universidad de Sevilla, Spain
- 16.00. – 16.20 *Maximal determinant of some matrices with equal entry sums of rows and columns and designs optimality*
Augustyn Markiewicz, Poznan University of Life Sciences, Poland

Chair: J.A. Bondy

- 16.40 – 17.00 *On the exponent of boolean primitive circulant matrices*
Susana Furtado, Faculdade de Economia do Porto, Portugal
- 17.05 – 17.25 *Zero forcing sets and bipartite circulants*
Seth Meyer, University of Wisconsin-Madison, USA
- 17.30 – 17.55 *Some combinatorial aspects of the spectra of circulant graphs*
Paula Rama, University of Aveiro, Portugal

Room *17 de Abril*

Chair: Michael Drmota

- 15.10 – 15.30 *On nonobtuse and acute binary simplices*
Jan Brandts, University of Amsterdam, Netherlands
- 15.35 – 15.55 *Convex solution of a correspondence problem*
Marko Stošić, Instituto de Sistemas e Robótica, IST, Portugal
- 16.00. – 16.20 *Vectors in a box*
Dömötör Pálvölgyi, École Polytechnique Fédérale de Lausanne, Switzerland

Chair: Hadi Kharaghani

- 16.40 – 17.00 *A class of polytopes associated with graphs*
Roger Behrend, School of Mathematics, Cardiff University, UK
- 17.05 – 17.25 *Infinite families of regular expanders of arbitrary constant degree obtained via the modified zig-zag product*
Cristina Ballantine, College of the Holy Cross, Worcester, USA
- 17.30 – 17.55 *The adjacency matrix of graphs and regular graphs*
Cheryl Zefara, University of Malta, Malta

Friday - June 18, 2010

Chair: Christian Krattenthaler

09.00 – 09.45 Plenary Session

Combinatorial batch codes, matroids, and $\mathcal{A}(R,S)$

Richard A. Brualdi

Bascom Professor of Mathematics, Emeritus
University of Wisconsin – Madison, USA

09.45 – 10.30 Plenary Session

Majorization, $\mathcal{A}(R,S)$ and related matrix classes

Geir Dahl

Center of Mathematics for Applications CMA, University of Oslo, Norway

10.30 – 11.00 Coffee Break

Chair: Irene Sciriha

11.00 – 11.45 Plenary Session

Random planar graphs

Michael Drmota

Head of Institut für Diskrete Mathematik und Geometrie, TU Wien, Austria

11.45 – 12.30 Plenary Session

Switching reconstruction

J.A. Bondy

Institut Camille Jordan, Université Claude Bernard Lyon 1, France

12.30 – 14.00 Lunch

Chair: Domingos M. Cardoso

14.00 – 14.30 Special Lecture

A de Bruijn – Erdős theorem in metric spaces?

Vašek Chvátal

Canada Research Chair in Combinatorial Optimization
Concordia University, Montréal, Québec, Canada

14.30 – 15.40 Contributed Talks – Parallel Sessions

15.40 – 16.10 Coffee Break

16.10 – 17.20 Contributed Talks

19.00 Conference Dinner – Dedicated to Professor Dias da Silva

Speakers: **Melvyn B. Nathanson, Graciano de Oliveira, Richard A. Brualdi**

Contributed Talks

Room *Pedro Nunes*

Chair: Catherine Greenhill

- 14.30 – 14.50 *A characterization of certain (0,1) matrices*
Trevor Bruen, Saint Francis Xavier University, Canada
- 14.55 – 15.15 Nearly reducible matrices
Carlos Marijuán, Universidad de Valladolid, Spain
- 15.20. – 15.40 Hall exponents
Kathleen Kiernan, University of Wisconsin-Madison, USA

Chair: Brendan McKay

- 16.10 – 16.30 *On the Gibson problem for permanents of (0,1)-matrices*
Alexander Guterman, Moscow State University, Russia
- 16.35 – 16.55 *Results towards the Dittert Conjecture*
Ian Wanless, Monash University, Australia
- 17.00 – 17.20 *0-1 matrix reordering problem and applications*
Lemnour Noui, University of Batna, Algeria

Room *17 de Abril*

Chair: Ricardo Mamede

- 14.30 – 14.50 *Matrix semigroups with binary diagonals*
Leo Livshits, Colby College, Waterville, Maine, USA
- 14.55 – 15.15 *Applications of Boolean matrix theory to some problems in max-linear algebra*
Sergei Sergeev, University of Birmingham, UK
- 15.20. – 15.40 *An analogue of near-factorization of finite groups*
Hidehiro Shinohara, Osaka University, Japan

Saturday - June 19, 2010

Chair: Richard A. Brualdi

09.00 – 09.45 Plenary Session

The number of matrices and a random matrix with prescribed row and column sums and 0-1 entries

Alexander Barvinok

Department of Mathematics, University of Michigan, USA

09.45 – 10.30 Plenary Session

Increasing and decreasing chains in 0-1 matrices and RSK-like algorithms

Christian Krattenthaler

Fakultät für Mathematik, Universität Wien, Austria

10.30 – 11.00 Coffee Break

Chair: Vašek Chvátal

11.00 – 11.45 Plenary Session

The minimal basis of the nullspace of singular graphs

Irene Sciriha

Department of Mathematics, University of Malta, Malta

11.45 – 12.30 Plenary Session

Graph eigenvalues in combinatorial optimization

Domingos M. Cardoso

Department of Mathematics, University of Aveiro, Portugal

12.30 – 14.00 Lunch

14.00 – 15.35 Contributed Talks – Parallel Sessions

15.35 – 16.00 Coffee Break

16.00 – 17.15 Contributed Talks – Parallel Sessions

17.15 – 17.30 Closing Session

18.30 – Excursion

Contributed Talks

Room *Pedro Nunes*

Chair: Melvyn B. Nathanson

- 14.00 – 14.20 *Symmetric Hamilton cycle decompositions of graphs*
Michael W. Schroeder, University of Wisconsin-Madison, USA
- 14.25 – 14.45 *Nonregular integral graphs of maximum degree four*
Slobodan K. Simić, Mathematical Institute, SANU, Serbia
- 14.50. – 15.10 *Commuting and noncommuting graphs of matrices over semirings*
David Dolžan, University of Ljubljana, Slovenia
- 15.15 – 15.35 *Cross-intersecting families of 0-1 matrices*
Peter Borg, University of Malta, Malta

Chair: Gyula O.H. Katona

- 16.00 – 16.20 *Partial covering arrays and a generalized Erdős-Ko-Rado theorem*
Anant Godbole, East Tennessee State University, USA
- 16.25 – 16.45 *Extremal families of union-independent sets*
Miodrag Živković, University of Belgrade, Serbia
- 16.50 – 17.15 *The number of C_3 -free vertices on 3-partite tournaments*
Rita Zuazua, FCiencias, UNAM, Mexico

Room *17 de Abril*

Chair: Susana Furtado

- 14.00 – 14.20 *Matrix pencils completion problems*
Marija Dodig, CELC, Universidade de Lisboa, Portugal
- 14.25 – 14.45 *Tensors, matchings and codes*
Maria Manuel Torres, CELC, Universidade de Lisboa, Portugal
- 14.50. – 15.10 *Search with density tests*
Balázs Keszegh, École Polytechnique Fédérale de Lausanne, Switzerland
- 15.15. – 15.35 *The compositions of differential operations and Gateaux directional derivative*
Ivana Jovović, University of Belgrade, Serbia

Chair: Slobodan Simić

- 16.00 – 16.20 *Relations between (κ, τ) regular sets and star complements*
Milica Anđelić, University of Aveiro, Portugal
- 16.25 – 16.45 *Sum-product estimates for well-conditioned matrices*
Jozsef Solymosi, The University of British Columbia, Canada
- 16.50 – 17.15 *A modified precondition in the Gauss-Seidel, SOR and AOR methods*
Alimohammad Nazari, Arak University, Iran