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DATE

August 9, 2011.

AFFILIATION

Associate Professor at the Deptartamento de Ingeniería Matemática, Facultad de Ciencias Físicas y Matemáticas, Universidad de Chile.

EDUCATION

Ph.D. in Computer Science.
École Normale Supérieure de Lyon, France, 1998.

Engineer. Major in Mathematics.
Universidad de Chile, Santiago, Chile, 1995.

PUBLICATIONS

DISCRETE MATHEMATICS AND THEORETICAL COMPUTER SCIENCE

Communication complexity in number-preserving cellular automata. E. Goles, A. Moreira and I. Rapaport. Theoretical Computer Science 412/29 (2011), 3616-3628.

Traced communication complexity of cellular automata. E. Goles, P. Guillon and I. Rapaport. Theoretical Computer Science 412/30 (2011), 3906-3916.

Adding a referee to an interconnection network: What can(not) be computed in one round? F. Becker, M. Matamala, N. Nisse, I. Rapaport, K. Suchan and I. Todinca. To appear in the Proceedings of the 25th IEEE International Parallel and Distributed Processing Symposium.

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Average long-lived memoryless consensus: the three-value case. I. Rapaport and E. Rémila. Proceedings of the 17th International Colloquium on Structural Information and Communication Complexity (SIROCCO 2010), Lecture Notes in Computer Science 6058 (2010), 114-126.

Distributed computing of efficient routing schemes in generalized chordal graphs. N. Nisse, I. Rapaport and K. Suchan. Proceedings of the 16th International Colloquium on Structural Information and Communication Complexity (SIROCCO 2009), Lecture Notes in Computer Science 5869 (2010), 252-265.

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Average binary long-lived Consensus: quantifying the stabilizing role played by memory. Proceedings of the 15th International Colloquium on Structural Information and Communication Complexity (SIROCCO 2008), Lecture Notes in Computer Science 5058 (2008), 48-60.

On dissemination thresholds in regular and irregular graph classes. I. Rapaport, K. Suchan, I. Todinca and J. Verstraete. Algorithmica (2011) 59: 16-34. Proceedings of the 8th Latin American Theoretical Informatics Symposium (LATIN 2008), Lecture Notes in Computer Science 4957 (2008), 24-35.

Small alliances in graphs. R. Carvajal, M. Matamala, I. Rapaport and N. Schabanel. Proceedings of the 32nd Symposium on Mathematical Foundations of Computer Science (MFCS 2007), Lecture Notes in Computer Science 4708 (2007), 218-227.

Self-Assemblying classes of shapes, fast and with minimal number of tiles. F. Becker, E. Rémila and I. Rapaport. Proceedings of the 26th Conference on Foundations of Software Technology and Theoretical Computer Science (FSTTCS 2006), Lecture Notes in Computer Science 4337 (2006), 45-56.

Minimal proper interval completions. I. Rapaport, K. Suchan and I. Todinca. Information Processing Letters 106 (2008), 195-202. Proceedings

of the 32nd International Workshop on Graph-Theoretic Concepts in Computer Science (WG 2006), Lecture Notes in Computer Science 4271 (2006), 217-228.

Cellular automata and communication complexity. C. Dürr, I. Rapaport and G. Theyssier. Theoretical Computer Science 322/2 (2004), 355-368.

AT-free graphs: linear bounds for the oriented diameter in terms of the diameter. F. Fomin, M. Matamala, E. Prisner and I. Rapaport. Discrete Applied Mathematics 141 (2004), 135-148.

Domino tilings and other physical models: space of configurations of domains with holes. S. Desreux, M. Matamala, I. Rapaport and E. Rémila. Theoretical Computer Science 319 (2004),83-101.

The complexity of approximating the oriented diameter of chordal graphs. F. Fomin, M. Matamala and I. Rapaport. Journal of Graph Theory 45(4), 2004, 255-269. Proceedings of the 28th International Workshop on Graph-Theoretic Concepts in Computer Science (WG 2002), Lecture Notes in Computer Science 2573 (2002), 211-222.

Tiling with bars under tomographic constraints. C. Dürr, E. Goles, I. Rapaport and E. Rémila. Theoretical Computer Science 290 (2003), 1317-1329.

Who wins Domineering on rectangular boards? M. Lachmann, C. Moore and I. Rapaport. *More Games of No Chance*, MSRI Publications 42 (2002), 307-315, Cambridge University Press.

k-Pseudosnakes in large grids. M. Matamala, E. Prisner and I. Rapaport. Proceedings of the 5th Latin American Theoretical Informatics Symposium (LATIN 2002), Lecture Notes in Computer Science 2286 (2002), 224-235.

Tiling groups for Wang tiles. C. Moore, I. Rapaport and E. Rémila. Proceedings of the 13th ACM-SIAM Symposium on Discrete Algorithms (SODA 2002), 402-411.

Global fixed point attractors of circular cellular automata and periodic tilings of the plane: undecidability results. J. Mazoyer and I. Rapaport. Discrete Mathematics 199 (1999), 103-122 (*Editor's Choice Edition 1999*).

Tiling allowing rotations only. E. Goles and I. Rapaport. Theoretical Computer Science 218 (1999), 285-295.

Inducing an order on cellular automata by a grouping operation. J. Mazoyer and I. Rapaport. Discrete Applied Mathematics 91 (1999), 177-196. Proceedings of the 15th Symposium on Theoretical Aspects of Computer Science (STACS 1998), Lecture Notes in Computer Science 1373 (1998), 116-127.

Additive cellular automata over Z_p and the bottom of (CA,$\leq$). J. Mazoyer and I. Rapaport. Proceedings of the 23rd Symposium on Mathematical Foundations of Computer Science (MFCS 1998), Lecture Notes in Computer Science 1450 (1998), 834-843.

Complexity of tile rotation problems. E. Goles and I. Rapaport. Theoretical Computer Science 188 (1997), 129-159.

COMPUTATIONAL BIOLOGY

Modeling heterocyst pattern formation in cyanobacteria. Z.P. Gerdtzen, J.C. Salgado, A. Osses, J.A. Asenjo, I. Rapaport and B.A. Andrews. To appear in BMC Bionformatics 2009 10(6).

A discrete mathematical model applied to genetic regulation and metabolic networks. J. Asenjo, P. Ramirez, I. Rapaport, J. Aracena, E. Goles and B. Andrews. J. Microbiology and Biotechnology Vol. 17, 2007, 3:496–510.

New approaches for predicting protein retention time in hydrophobic interaction chromatography. M.E. Lienqueo, A. Mahn A, G. Navarro, T. Perez-Acle, C. Salgado, I. Rapaport and J. Asenjo. Journal of Molecular Recognition 2006 Jul-Aug; 19(4): 260-269.

Predicting the behaviour of proteins in hydrophobic interacton chromatography 2: Using a statistical description of their surface amino acid distribution. C. Salgado, I. Rapaport and J. Asenjo. Journal of Chromatography A, 1107, (2006), 120-129.

Predicting the behaviour of proteins in hydrophobic interacton chromatography 1: Using the hydrophobic imbalance (HI) to describe their surface amino acid distribution. C. Salgado, I. Rapaport and J. Asenjo. Journal of Chromatography A, 1107, (2006), 110-119.

Prediction of retention times of proteins in hydrophobic interaction chromatography using only their amino acid composition. C. Salgado, I. Rapaport and J. Asenjo. Journal of Chromatography A, 1098 (2005), 44-154.

Is it possible to predict the average surface hydrophobicity of a protein using only its amino acid composition? C. Salgado, I. Rapaport and J. Asenjo. Journal of Chromatography A, 1075 (2005), 133-143.

GUIDANCE OF STUDENTS

CURRENT

Pierre-Etienne Meunier. PhD. thesis in Mathematical Modeling, Universidad de Chile. "Intrinsic universality in cellular automata". Advisors: Ivan Rapaport and Guillaume Theyssier.

Raimundo Briceño. Mathematical Engineering thesis, Universidad de Chile,. "Cellular automata and communication complexity". Advisor: Ivan Rapaport.

GRADUATED

Rodolfo Carvajal. Mathematical Engineering thesis, Universidad de Chile, 2006. "Communities in graphs". Advisor: Ivan Rapaport.

Ángela Cintolesi. Engineering thesis in Biotechnology, Universidad de Chile, 2006. "Differential equations applied to metabolic and genetic networks in yeast" (*Roberto Ovalle Aguirre* award). Advisors: Juan Asenjo and Ivan Rapaport.

Cristian Salgado. PhD. thesis in Biotechnology, Universidad de Chile, 2005. "Prediction of the behavior of proteins in hydrophobic interaction chromatography". Advisors: Juan Asenjo and Ivan Rapaport.

Cristóbal Rojas. Mathematical Engineering thesis, Universidad de Chile, 2003. "Cellular automata and self-assembly". Advisor: Ivan Rapaport.

RESEARCH GRANTS AND FELLOWSHIPS

Research leader of the Fondecyt grant *Cellular Automata: A communication Complexity Perspective*, 2009-2012.

Research leader of the Ecos-Conicyt grant *Tilings: Flips and Self-Assembly*, 2005-2008.

Researcher of the Anillo-Conicyt grant *Networks in Mathematics and Engineering Sciences*, 2005-2008.

Researcher of the Millenium-Mideplan grant *Institute for Cell Dynamics and Biotechnology*, 2007-2011.

Research leader of the Fondecyt grant *Cellular Automata, Tilings and Graphs*, 2002-2005.

Research leader of the Fondecyt grant *Cellular Automata and Tilings*, 1999-2002.

Scholarship of the *Ministère des Affaires Etrangères*, France, 1998.

Fellowship "Presidente de la República". Mideplan, 1995-1998.

Fellowship "Excelencia Académica". Universidad de Chile, 1988.

TEACHING

Combinatorial Optimization (2010, 2008, 2004).

Probability (2010, 2009, 2008, 2007, 2005, 2003, 2002).

Introduction to Algebra (2007, 2005, 2003, 2002, 2001, 2000, 1999).

Linear Algebra (2010, 2009, 2008, 2006, 2004, 2001, 2000, 1999).

Calculability and Computational Complexity (2006, 2003, 2001).

Communication Complexity (2005, 2000).

Calculus of Several Variables (1999).