Russell Martin

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Work Experience

Current, from August 2005

Lecturer
University of Liverpool, Dept of Computer Science

January 2004 – August 2005
October 2001 – October 2003

Postdoctoral Research Fellow
University of Warwick, Dept of Computer Science

Supported by United Kingdom Engineering and Physical Sciences Reearch Council (EPSRC) grants GR/R44560/01 "Analysing Markov Chain-based Random Sampling Algorithms" and "Discontinuous Behaviour in the Complexity of Randomised Algorithms".

October 2003 – December 2003

Visiting Resesarcher
Simon Fraser University, School of Computing Science

April 1998 – December 2000

Graduate Research Assistant
Georgia Institute of Technology, School of Mathematics

Paid by College of Computing. Supported in part by National Science Foundation grant CCR-9703206.

Research Grants

April 2012 – March 2013
Dollywagon, Ltd., £26500 (with L. Gąsieniec)
(Knowledge Exchange)
"Efficient Harvesting of Social Networks Data"

January 2011 — January 2013
Royal Society, £12000 (with L. Gąsieniec)
"SEarch, RENdezvous, and Explore (SERENE)"

Oct 2008 – Sept 2010
EPSRC, First Grant Scheme, £183312
"Markov Chain Algorithms for Sampling Matchings, Tilings,and Euler Tours"

July 2007 — June 2009
Royal Society, £4500 (with L. Gąsieniec and D. Kowalski)
"Geometric sensor networks with random topology - structures and communication"

May 2006 — Dec 2009
Nuffield Foundation,Newly Appointed Lecturers in Science,Engineering,and Mathematics 2006, £4500
"The structure and efficient utilization of the Internet and other distributed systems"

Education

December 2001 — **Doctor of Philosophy**
Applied Mathematics
Georgia Institute of Technology

August 1994 — **Master of Science**
Applied Mathematics
Clemson University

May 1992 — **Bachelor of Science**
Mathematics
Syracuse University

Research Interests

- Randomized algorithms
- Makov Chain Monte Carlo algorithms for sampling and counting
- Distributed computing
- Rendezvous, broadcasting, evacuation
- Combinatorics

Managment/Leadership Roles

May 2014 – present

Director, NeST Software Labs

September 2011 – September 2013

Deputy Assessment Officer, Dept of Computer Science

PhD Student Supervision

As First Supervisor

1. Thomas Gorry (submitting thesis October 2014)
2. David Hamilton
3. Tao Shang

As Second Supervisor

4. Fatimah Abdullahi
5. Mihai Burcea
6. Ashely Farrugia
7. Jie Min
8. Tom Nickson (graduated July 2013)
9. Rafiq Saleh (graduated July 2012)

Program Committee Membership

11th Intl. Workshop on Randomization and Computation (RANDOM 2007)

17th Intl. Workshop on Randomization and Computation (RANDOM 2013)

19th Intl. Symposium on Fundamentals of Computation Theory (FCT 2013)

2015 ACM Symposium on Princicples of Distributed Computing (PODC 2015)

Modules Taught at Liverpool

Winter 2006	Complexity of Algorithms (COMP 202) 46 students
Autumn 2006	Web Programming (COMP 519) 13 students
Winter 2007	Complexity of Algorithms (COMP 202) 22 students
Autumn 2007	Web Programming (COMP 519) 12 students
Winter 2008	Complexity of Algorithms (COMP 202) 28 students
Autumn 2008	Web Programming (COMP 519) 16 students
Winter 2009	Complexity of Algorithms (COMP 202) 29 students
Autumn 2009	Web Programming (COMP 519) 19 students
Winter 2010	Complexity of Algorithms (COMP 202) 31 students
Autumn 2010	Web Programming (COMP 519) 22 students
Winter 2011	Complexity of Algorithms (COMP 202) 39 students
Autumn 2011	Web Programming (COMP 519) 10 students
Winter 2012	Complexity of Algorithms (COMP 202) 32 students
Autumn 2012	Web Programming (COMP 519) 9 students
Winter 2013	Complexity of Algorithms (COMP 202) 28 students
Summer 2013	MSc Project (COMP 702) 38 students
Autumn 2013	Web Programming (COMP 519) 5 students
Winter 2014	Complexity of Algorithms (COMP 202) 42 students
Summer 2014	MSc Project (COMP 702) 15 students

Publications (Journals)

1. Exploring self-duality in graphs, with C. Depaolo, *Pi Mu Epsilon Journal* **9** (1992), pp. 422—429.
2. A core of a block graph, with R. Laskar, *Congressus Numerantium* **101** (1994), pp. 171—185.
3. Random sampling of 3-colorings in $\mathbb{Z}^2$, with L.A. Goldberg and M. Paterson, *Random Structures & Algorithms* **24** (2004), pp. 279—302.
4. Strong spatial mixing with fewer colors for lattice graphs, with L.A. Goldberg and M. Paterson, *SIAM J. Computing* **35** (2005), pp. 486—517. (Conference version appears in *Proc. 45th Annual IEEE Symposium on Foundations of Computer Science (FOCS 2004)*, pp. 562—571.)
5. Rapidly mixing Markov chains for sampling contingency tables with a constant number of rows, with M. Cryan, M. Dyer, L.A. Goldberg, and M. Jerrum, *SIAM J. Computing* **36** (2006), pp. 247—278. (Conference version appears in *Proc. 43rd Annual IEEE Symposium on Foundations of Computer Science (FOCS 2002)*, pp. 711–720.
6. Improved mixing bounds for the anti-ferromagnetic Potts model on $\mathbb{Z}^2$, with L.A. Goldberg, M. Jalsenius, and M. Paterson, *LMS J. Computation and Mathematics* **9** (2006), pp. 1—20.
7. Disjoint decomposition of Markov chains and sampling circuits in Cayley graphs, with D. Randall, *Combinatorics, Probability, and Computing* **15** (2006), pp. 411—448.
8. Markov chain comparison, with M. Dyer, L.A. Goldberg, and M. Jerrum, *Probability Surveys* **3** (2006), pp. 89—111 (electronic).
9. Utilitarian resource assignment, with P. Berenbrink, L.A. Goldberg, and P. Goldberg, *J. Discrete Algorithms* **4** (2006), pp. 567–587.
10. Distributed selfish load balancing, with P. Berenbrink, T. Friedetzky, L.A. Goldberg, P. Goldberg, and Z. Hu. *SIAM Journal on Computing* **37** (2007), pp. 1163—1181. (Conference version appears in *Proc. 17th Annual ASM-SIAM Symposium on Discrete Algorithms (SODA 2006)*, pp. 354—363.)
11. On the stability of dynamic diffusion load balancing, with P. Berenbrink and T. Friedetzky, *Algorithmica* **50** (2008), pp. 329—350.
12. Fast periodic graph exploration with constant memory, with L. Gąsieniec, R. Klasing, A. Navarra, and X. Zhang, *J. Computer and System Science* **74** (2008), pp. 808—822. (Conference version appears in *Proc. 14th Colloquium on Structural Information and Communication Complexity (SIROCCO 2007)*, pp. 26–40.)
13. Exact counting of Euler tours for generalized series-parallel graphs, with P. Chebolu and M. Cryan, *J. Discrete Algorithms* **10** (2012), pp. 110—122.
14. The complexity of counting stable matchings, with P. Chebolu and L.A. Goldberg, *Theoretical Computer Science* **437** (2012), pp. 35—68. (Conference version appears in *Proc. 13th International Workshop on Approximation Algorithms for Combinatorial Optimization Problems (APPROX 2010)*, pp. 81—94.)
15. The complexity of approximately counting stable roommate assignments, with P. Chebolu and L.A. Goldberg, *J. Computer and Systems Sciences* **78** (2012), pp. 1579—1605.
16. More efficient periodic traversal in anonymous undirected graphs, with J. Czyzowicz, S. Dobrev, L. Gąsieniec, D. Ilcinkas, J. Jansson, R. Klasing, I. Lignos, K. Sadakane, and W.-K. Sung, *Theoretical Computer Science* **444** (2012), pp. 60—76. (Conference version appears in *Proc. 16th Colloquium on Structural Information and Communication Complexity (SIROCCO 2009)*, pp. 174–188.)
17. Geometric computations by broadcasting automata, with T. Nickson and I. Potapov, *Natural Computing* **11** (2012), pp. 623–635. (Conference version appears in *Proc. 10th International Conference on Unconventional Computing (UC 2011)*, pp. 138—151.)

Publications (Conference Proceedings)

18. Pfaffian algorithms for sampling tilings on regions with free boundary conditions, with D. Randall, *3rd International Workshop on Randomization and Approximation Techniques* in *Lecture Notes in Computer Science* **1671** (1999), Springer, Berlin, pp. 257—268.
19. Sampling adsorbing staircase walks using a new Markov chain decomposition method, with D. Randall, *Proc. 41st Annual IEEE Symposium on Foundations of Computer Science (FOCS 2000)*, pp. 492—502.

20. On weighted balls-into-bins games, with P. Berenbrink, T. Friedetzky, and Z. Hu, *Proc. 22nd International Symposium on Theoretical Aspects of Computer Science (STACS 2005)*, pp. 231—243.

21. Dynamic diffusion load balancing, with P. Berenbrink and T. Friedetzky, *Proc. 32nd International Colloquium on Automata, Languages, and Programming (ICALP 2005)*, pp. 1386–1398.

22. Synchronous rendezvous for location-aware agents, with A. Collins, J. Czyzowicz, L. Gąsieniec, and A. Kosowski, *Proc. 25th International Symposium on Distributed Computing (DISC 2011)*, pp. 447—459.

23. Observe and remain silent (Communication-less agent location discovery, with T. Friedetzky, T. Gorry, and L. Gąsieniec, *Proc. 37th International Symposium on Mathematical Foundations of Computer Science (MFCS 2012)*, pp. 407—418.

24. Optimal patrolling of fragmented boundaries, with A. Collins, J. Czyzowicz, L. Gąsieniec, A. Kosowski, E. Kranakis, D. Krizanc, and O. Morales Ponce, *Proc. 25th ACM Symposium on Parallelism in Algorithms and Architectures (SPAA 2013)*, pp. 241–250.

25. A novel approach for identifying banded patterns in zero-one data using column and row banding scores, with F.B. Abdullahi and F. Coenen, *Proc. 10th International Conference on Machine Learning and Data Mining in Pattern Recognition (MLDM 2014)*, pp. 58–72.

26. Evacuating robots from an unknown exit in a disk, with J. Czyzowicz, L. Gąsieniec, T. Gorry, E. Kranakis, and D. Pająk, accepted to *28th International Symposium on Distributed Computing (DISC 2014)*.

Publications (Other)

27. Paths, Sampling, and Markov Chain Decomposition. PhD thesis, Georgia Institute of Technology (2001).

28. Reverse Engineering of Web Applications: A Technical Review, with R. Patel, F. Coenen, and L. Archer, University of Liverpool Department of Computer Science Technical Report, ULCS-07-017, August 2007.

29. Exact counting of Euler tours for graphs of bounded treewidth, with P. Chebolu and M. Cryan, unpublished manuscript, `http://arxiv.org/abs/1310.0185` (2013).