

Adam W. Hackett

CONTACT INFORMATION

Postdoctoral Researcher
Hamilton Institute
National University of Ireland, Maynooth
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AFFILIATIONS

Hamilton Institute, National University of Ireland, Maynooth.
[IBM](#), Exascale Systems Group, Dublin Research Lab.
[MACSI](#): Mathematics Applications Consortium for Science and Industry.

RESEARCH INTERESTS

I am interested in providing mathematical models of the behaviours exhibited by complex systems. Through the analysis of the network topologies (graphs) on which many of these systems evolve, I aim to provide a mathematical interpretation of a diverse range of phenomena. My current research focuses on the application of matrix and graph theory to exascale computing systems.

EDUCATION

University of Limerick, Limerick, Ireland

Ph.D., Department of Mathematics & Statistics, January 2012

- Dissertation: “Cascade Dynamics on Complex Networks.” [[Abstract](#)]
- Advisor: Prof. James P. Gleeson (SFI principal investigator).
- External examiner: Prof. Peter S. Dodds (University of Vermont).

University of Limerick, Limerick, Ireland

B.Sc. (1st honours), Financial Mathematics, May 2008

- Final year project: “Anticipation in Economic Systems.”
- Advisor: Dr. Mark Burke.

Colaiste Mhichíl, Limerick, Ireland

Leaving Certificate, May 2004

- Six honours, including A1s in Mathematics and Applied Mathematics.

ACADEMIC EXPERIENCE

National University of Ireland, Maynooth, Co. Kildare, Ireland

Postdoctoral Researcher

Oct 2011 – present

Research conducted in collaboration with the Exascale Systems Group at IBM Dublin Research Lab.

University of Limerick, Co. Limerick, Ireland

Graduate Student

July 2008 – Oct. 2011

Includes Ph.D. research, teaching assistance, and participation in research/consulting projects facilitated by MACSI.

Teaching Assistant

Sept. 2008 – Oct. 2011

Duties included tutorial and computer laboratory session tutor, Mathematics Learning Centre instructor, examination invigilator, and mid-term and final examination grader.

- MA4702, Technology Mathematics 2. Tutorials and Labs., Feb.–May 2011.
- MA4003, Engineering Mathematics 3. Tutorials, Sept.–Dec. 2010.

- MLC, Mathematics Learning Centre. Drop-in sessions, Sept.–Dec. 2010.
- MA4602, Science Mathematics 2. Tutorials, Feb.–May 2010.
- MA4003, Engineering Mathematics 3. Tutorials, Sept.–Dec. 2009.
- MA4002, Engineering Mathematics 2. Tutorials, Feb.–May 2009.
- MA4003, Engineering Mathematics 3. Tutorials, Sept.–Dec. 2008.

Consultation

Participant in ESGI-75, the 75th European Study Group with Industry, hosted by MACSI at the University of Limerick, 27 June – 2 July 2010.

Project: “Optimising voice quality in conference calls,” in collaboration with Intel Ireland.

AWARDS AND SCHOLARSHIPS

- 2011: Enterprise Partnership Scheme grant. Funding for a postdoctoral research project from the Irish Research Council and IBM Research Ireland.
- 2010: Second prize in the Best Paper Awards at ECCS 2010: European Conference on Complex Systems, Lisbon, Portugal, 2010.
- 2004: J. P. McManus scholarship award. Funding for undergraduate education.

PUBLICATIONS

Journal Papers

- Hackett, A., and Gleeson, J.P. Cascades on clique-based graphs. *Phys. Rev. E* 87, [062801](#) (2013). [[arXiv:1206.3075](#)]
- Hackett, A., Melnik, S., and Gleeson, J.P. Cascades on a class of clustered random networks. *Phys. Rev. E* 83(5), [056107](#) (2011). [[arXiv:1012.3651](#)]
- Melnik, S., Hackett, A., Porter, M.A., Mucha, P.J., and Gleeson, J.P. The unreasonable effectiveness of tree-based theory for networks with clustering. *Phys. Rev. E* 83(3), [036112](#) (2011). [[arXiv:1001.1439](#)]
- Gleeson, J.P., Melnik, S., and Hackett, A. How clustering affects the bond percolation threshold in complex networks. *Phys. Rev. E* 81(6), [066114](#) (2010). [[arXiv:0912.4202](#)]

Conference Papers

- Hackett, A., Ajwani, D., Ali, S., Kirkland, S., and Morrison, J.P. A network configuration algorithm based on optimization of Kirchhoff index. In proceedings of the 27th IEEE International Parallel and Distributed Processing Symposium ([IPDPS 2013](#)), May 20–24, 2013, Boston, MA., USA.
- Hackett, A., Ajwani, D., Ali, S., Kirkland, S., and Morrison, J.P. Seeds for a heterogeneous interconnect. 22nd International Heterogeneity in Computing Workshop ([HCW 2013](#)). In proceedings of the 27th IEEE International Parallel and Distributed Processing Symposium ([IPDPS 2013](#)), May 20–24, 2013, Boston, MA., USA.
- Hackett, A., Gleeson, J.P., and Melnik, S. Site percolation in clustered random networks. *Int. J. Comp. Syst. Sci.* 1, pp. 25–32, (2011). In proceedings of [Net-Works 2010](#): International Conference, June 8–10, 2010, Zaragoza, Spain.
- Melnik, S., Hackett, A., Porter, M.A., Mucha, P.J., and Gleeson, J.P. The unreasonable effectiveness of tree-based theory for bond percolation on networks with clustering. In proceedings of [ECCS 2010](#): European Conference on Complex Systems, Sept. 13–17, 2010, Lisbon, Portugal.

Book Chapter

- Gleeson, J.P., Hurd, T.R., Melnik, S., and Hackett, A. Systemic risk in banking networks without Monte Carlo simulation. *Advances in Network Analysis and its Applications*, Springer Mathematics in Industry series 18, 2013, pp. 27–56.

PRESENTATIONS

Talks

- Seeds for a heterogeneous interconnect. IPDPS 2013: IEEE International Parallel And Distributed Processing Symposium, Boston MA., USA., May 20–24, 2013.
- Cascade dynamics on complex networks. Hamilton Institute seminar, Hamilton Institute, National University of Ireland, Maynooth, Co. Kildare, Ireland, March 14, 2012.
- On contagion processes in complex networks. FMC2/MACSI colloquium, Michael Smurfit Business School, UCD, Dublin, Ireland, March 24, 2011.
- The unreasonable effectiveness of tree-based theory for cascade dynamics on complex networks. ECCS 2010: European Conference on Complex Systems, Lisbon, Portugal, Sept. 13–17, 2010.
- Percolation in a class of clustered random networks. Net-Works 2010: International Conference, Zaragoza, Spain, June 8–10, 2010.

Posters

- Percolation in a class of clustered random networks. NetSci 2010: International School and Conference on Network Science, Boston, MA., USA, May 10–14, 2010.
- The role of high degree nodes in global cascades on random networks. NetSci 2009: International Workshop on Network Science, Venice, Italy, June 29–July 03, 2009.

COMPUTER SKILLS

- Programming languages: C++, Prolog.
- Mathematics/statistics packages: MATLAB, Maple, Minitab, SPSS, R.
- Algorithms: Extensive experience of programming with large adjacency matrices representing graphs with various structural properties; numerical simulations of stochastic processes on graphs using those adjacency matrices; genetic algorithms; Monte-Carlo simulations.

PROFESSIONAL
EXPERIENCE

Atlantic University Alliance, University of Limerick, Limerick, Ireland

Co-operative Education Placement

Feb. – Sept. 2007

Role: Administration.

REFEREES

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Department of Mathematics & Statistics
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