

Marya Bazzi

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EDUCATION

UNIVERSITY OF OXFORD, OXFORD–UNITED KINGDOM

2015 D.Phil., Applied Mathematics

Thesis topic: Community structure in temporal multilayer networks, and its application to financial correlation networks

Thesis supervisors: Mason Porter and Sam Howison, in collaboration with HSBC Bank FX Quantitative Strategy Group

2010 M.Sc., Mathematical Modeling and Scientific Computing, *with Distinction*

Dissertation topic: Matrix completion (i.e., recovery of unknown entries in an incomplete data matrix).

Applications include collaborative filtering recommender systems

Dissertation supervisors: Andy Wathen and Martin Lotz

AMERICAN UNIVERSITY OF BEIRUT, BEIRUT–LEBANON

2009 B.Sc., Pure Mathematics, Minor in Philosophy and Minor in Economics, *with High Distinction*

On Dean's Honour List throughout degree

INTERNATIONAL COLLEGE, BEIRUT–LEBANON

2005 French Baccalaureate, Science Program - Math Emphasis, *Mention Très Bien*

PAPERS

[1] “Community detection in temporal multilayer networks, with an application to correlation networks”, Marya Bazzi, Mason A. Porter, Stacy Williams, Mark McDonald, Daniel J. Fenn, and Sam Howison. *Multi-scale Modeling and Simulation: A SIAM Interdisciplinary Journal*, Vol. 14, No. 1: 1-41, 2016.

Brief description: Investigates theoretical and computational features of a clustering method (“multilayer modularity maximization”) for temporal networks represented as multilayer networks, and its applicability to temporal correlation networks.

[2] “Generative benchmark models for mesoscale structure in multilayer networks”, Marya Bazzi, Lucas G. S. Jeub, Mason A. Porter, Alex Arenas, and Sam Howison, arXiv:1608.06196, 2016.

Brief description: Introduces a general and flexible generative benchmark model for “mesoscale” structure (e.g, community structure) in multilayer networks and compares the performance of various methods and algorithms on the proposed model.

SOFTWARE

“GenLouvain: A generalized Louvain method for community detection implemented in MATLAB”

Lucas G. S. Jeub, Marya Bazzi, Inderjit S. Jutla, and Peter J. Mucha

<http://netwiki.amath.unc.edu/GenLouvain> (2011-2016)

“A generative benchmark model for mesoscale structure in multilayer networks implemented in MATLAB”

Lucas G. S. Jeub and Marya Bazzi

<https://github.com/MultilayerBenchmark/MultilayerBenchmark> (2016)

WORK EXPERIENCE

UNIVERSITY OF OXFORD, OXFORD–UNITED KINGDOM

Oct. 2016–current Alan Tayler Visiting Research Fellow

- Developing research projects at the interface between academia and industry.

Oct. 2015–Oct. 2016 Postdoctoral research associate, with Mason Porter and Sam Howison

- Built on work from doctoral thesis (e.g., developed generative benchmark models for mesoscale structure in multilayer networks [2]).

SCHLUMBERGER, ABINGDON–UNITED KINGDOM

Feb. 2011–Aug. 2011 Research intern, Research and Development

- Developed massively parallel linear solver algorithms used in reservoir simulation for 2-dimensional and 3-dimensional standard grid structures with a large number of unknowns (on the order of a million), using the programming languages C++ and MATLAB.
- Tested solvers on simulated and real data sets, assessed and refined performance.

DATAFLOW, BEIRUT–LEBANON

Feb. 2007–Jul. 2007 Part-time employee

- Participated in a project for the translation and improvement of a high school mathematics curriculum.

TEACHING

MASTER THESIS SUPERVISION, MATHEMATICAL INSTITUTE, UNIVERSITY OF OXFORD

Apr. 2016–Sept. 2016

Co-supervised (jointly with Sam Howison and Mason Porter) the master thesis of Alexandra Darmon on “Algorithmic Classification of Writing Styles via Time-Series Analysis of Punctuation”.

TUTOR, SOMERVILLE COLLEGE, UNIVERSITY OF OXFORD

Oct. 2013–Jun. 2014

Delivered tutorials and marked students’ work on a weekly basis for the courses Linear Algebra and Continuous Mathematics from the first year undergraduate syllabus. Marked undergraduate admissions exams and assisted undergraduate admissions interviews in December 2013.

TEACHING ASSISTANT, MATHEMATICAL INSTITUTE, UNIVERSITY OF OXFORD

Oct. 2011–Jan. 2013

Marked students’ work and presented model solutions during problem solving classes for the courses Techniques of Applied Mathematics, Numerical Solutions of Differential Equations, and Applied Partial Differential Equations from the first and second year undergraduate syllabus.

NETWORKS OUTREACH

Participated in five Networks Outreach events aimed at introducing high school students to Network Science: Solihull (Nov 2012), Stoke-on-Trent (Dec 2012 and Feb 2014), Brentford (Nov 2013), and University of Oxford (Mar 2015). Took part in the module on Graph Theory.

SELECTED TALKS

INVITED TALKS

“*Community detection in temporal multilayer networks*”, at Université de Namur, Belgium, May 2016.

“*Global community detection method for temporal multilayer networks*”, at Université Catholique de Louvain, Belgium, Nov. 2014.

“*Community structure in temporal multilayer networks: null networks and inter-layer coupling*”, in the satellite “Dynamics On and Of Complex Networks” at The 4th International Conference on Complex Systems and Applications, UFR Sciences et Techniques, Le Havre, Jun. 2014.

CONTRIBUTED TALKS

“*Community detection in temporal multilayer networks*”, in the workshop on Network Science at the SIAM Annual Meeting, Boston, Jul. 2016.

“*Community structure in temporal multilayer networks and its application to financial correlation networks*”, in the satellite “Temporal Networks” at European Conference on Complex Systems, Lucca, Sept. 2014.

“Community structure in temporal multilayer networks”, in the satellite “Physics of Multilayered Interconnected Networks” at NetSci Conference, University of California, Berkeley, Jun. 2014.

SELECTED CONFERENCES, WORKSHOPS, AND ACADEMIC VISITS

Conferences

- European Conference on Complex Systems, Lucca, Sept. 2014
- The 4th International Conference on Complex Systems and Applications, Le Havre, Jun. 2014
- NetSci Conference, University of California, Berkeley, Jun. 2014
- Cambridge Networks Day, University of Cambridge, May 2013 and May 2014
- European Conference on Complex Systems, Barcelona, Sept. 2013
- NetSci Conference, Copenhagen, Jun. 2013
- European Dynamics Days Conference, Gothenburg, Sept. 2012

Workshops

- Workshop on Network Science, SIAM Annual Meeting, Boston, Jul. 2016
- Generalized Network Structures and Dynamics, Mathematical Biosciences Institute, Columbus, Mar. 2016
- Networks and Criminality, University of Oxford, Apr. 2015
- Time-dependent and Multiplex Networks, University of Oxford, Jul. 2013
- Complexity and Risk Workshop, Imperial College London, Jul. 2013
- Collaborating with Industry, University of Oxford, Jan. 2013

Academic Visits and Collaborations

- Spent 12 weeks between Oct. 2011 and Mar. 2015 at HSBC Bank in London to discuss and build on research project with industrial supervisors from the FX Quantitative Strategy Group.
- Member of “PLEXMATH” project funded by the European Commission to promote research on Multi-layer Networks (<http://www.plexmath.eu/>). Attended annual project meetings at Universidad Rovira i Virgili in Tarragona (Nov. 2012), University of Zaragoza (Nov. 2013), and University of Limerick (Aug. 2014).
- Visited Renaud Lambiotte’s research group at Université de Namur, Nov. 2014 and May 2016.
- Visited Jean-Charles Delvenne’s research group at Université Catholique de Louvain, Nov. 2014.
- Visited Alex Arenas’ research group at Universidad Rovira i Virgili in Tarragona, Nov. 2012 and Feb. 2014.
- Visited Marc Barthélemy’s research group at the Centre d’Energie Atomique in Saclay, Nov. 2013.
- Visited Vittoria Colizza’s research group at Université Pierre et Marie Curie in Paris, Nov. 2013.
- Visited Yamir Moreno’s research group at University of Zaragoza, Nov. 2013.
- Visited Andrea Bertozzi’s research group at University of California in Los Angeles, Jun.–Jul. 2013.

AWARDS

The Engineering and Physical Sciences Research Council (EPSRC) Industrial Cooperative Awards in Science and Technology (CASE) Studentship – University of Oxford, 2011

Details: Full funding (fees and maintenance) for doctoral studies.

Somerville College Benefactors’ Scholarship – Somerville College, University of Oxford, 2013

Details: Partial funding for a two week collaboration with Andrea Bertozzi’s research group at UCLA.

Oxford Centre for Collaborative Applied Mathematics Studentship – University of Oxford, 2009

Details: Unsolicited partial funding (course and college fees) for masters studies.

Muhanna Mathematics Award of Excellence – American University of Beirut, 2009

Details: Awarded to “the most outstanding senior student in the department of Mathematics”.

LANGUAGES AND COMPUTING

Languages English, French, and Arabic

Computing MATLAB, C++, JAVA, and LaTeX