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Lucas G. S. Jeub

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Personal Data

Born: May 13, 1989 in Brussels, Belgium
Nationality: German
Languages: German, English, French

Research Interests

My research interests lie in the intersection of Network Science, Data Analysis, and Applied Mathematics:

Dynamics on networks: Random walks, relationships between network structure and dynamics, dynamical processes on multilayer networks

Communities and other mesoscale structure: Local community detection methods, multiscale structure, consensus clustering, mesoscale structure in multiplex and temporal networks

Applications: Applications of network science to areas such as economics, sociology, and neuroscience

Research Positions

05/2019–present **Postdoctoral Researcher**
Institute for Scientific Interchange, Turin
Advisors: Prof. Yamir Moreno and Dr. Laetitia Gauvin

02/2019–03/2019 **External Consultant**
The Alan Turing Institute
NCSC Domain Discovery project

09/2016–04/2018 **Postdoctoral Researcher**
CNetS, Indiana University Bloomington
Advisor: Prof. Santo Fortunato

02/2016–07/2016 **Postdoctoral Research Assistant**
OCIAM, Mathematical Institute, University of Oxford
Advisors: Prof. Mason A. Porter and Prof. Sam D. Howison

Education

10/2011–02/2016 **DPhil in Mathematics**
OCIAM, Mathematical Institute, University of Oxford
Thesis: Networks, Communities, and Consumer Behaviour
Supervisor: Prof. Mason A. Porter
Funding: EPSRC CASE Studentship

09/2007–06/2011 **MSci, Mathematics with Economics**
University College London
First Class Honours
Project: Systemic risk in financial systems: Modelling contagious defaults through direct exposure and price effects using a dynamic network model

Publications

A framework for the construction of generative models for mesoscale structure in multilayer networks
M. Bazzi*, L. G. S. Jeub*, A. Arenas, S. D. Howison, M. A. Porter
Physical Review Research 2(2):023100 (2020)

Resting state network modularity along the prodromal late onset Alzheimer's disease continuum
J. A. Contreras, A. Avena-Koenigsberger, S. L. Risacher, J. D. West, E. Tallman, B. C. McDonald, M. R. Farlow, L. G. Apostolova, J. Goñi, M. Dzemidizic, Y.-C. Wu, D. Kessler, L. G. S. Jeub, S. Fortunato, A. J. Saykin, O. Sporns
NeuroImage: Clinical 22:101687 (2019)

Weight thresholding on complex networks
X. Yan, L. G. S. Jeub, A. Flammini, F. Radicchi, S. Fortunato
Physical Review E 98(4):042304 (2018)

Subsystem organization of axonal connections within and between the right and left cerebral cortex and cerebral nuclei (endbrain)
L. W. Swanson, J. D. Hahn, L. G. S. Jeub, S. Fortunato, O. Sporns
Proceedings of the National Academy of Sciences 115(29):E6910–E6919 (2018)

Multiresolution consensus clustering in networks
L. G. S. Jeub, O. Sporns, S. Fortunato
Scientific Reports 8(1):3259 (2018)

A local perspective on community structure in multilayer networks
L. G. S. Jeub, M. W. Mahoney, P. J. Mucha, M. A. Porter
Network Science 5(2):144–163 (2017)

Think locally act locally: Detection of small, medium-sized, and large communities in large networks
L. G. S. Jeub, P. Balachandran, M. A. Porter, P. J. Mucha, M. W. Mahoney
Physical Review E 91:012821 (2015)

Selected Talks

Generative benchmark models for mesoscale structure in multilayer networks
NetSci 2017, Indianapolis

A local perspective on community structure in multilayer networks (invited)
NetSci 2017 Satellite: Dynamics on and of complex networks, Indianapolis

Think Locally, Act Locally: The Detection of Small, Medium-Sized, and Large Communities in Large Networks (invited)
Université Catholique de Louvain, 2014

Think locally, act locally: The detection of small, medium-sized, and large communities in large networks
ECCS 2014, Lucca

Think locally, act locally: What can local community detection methods tell us about multilayer networks?
NetSci 2014 Satellite: Physics of multilayered interconnected networks, Berkeley

Think locally: A local perspective on community structure in networks
NetSci 2013, Copenhagen

Teach network science to teenagers (invited)
NetSci 2013 Satellite: NetSciEd2, Copenhagen

Posters

A local perspective on community structure in multiplex networks
MBI workshop ”Generalized Network Structures & Dynamics”, 2016, Columbus, Ohio

Clustering in bipartite consumer-product networks
Dynamics Days Europe 2012, Gothenburg

Academic Visits

11/2014	Visited Renaud Lambiotte’s research group at Université de Namur and Jean-Charles Delvenne’s research group at Université Catholique de Louvain
08/2014	Visited James Gleeson’s research group at the University of Limerick
02/2014	Visited Alex Arenas’ research group at Universidad Rovira i Virgili in Tarragona
11/2013	Visited Yamir Moreno’s research group at the University of Zaragoza
11/2012	Visited Alex Arenas’ research group at Universidad Rovira i Virgili in Tarragona

Software

HierarchicalConsensus: Consensus clustering method for identifying hierarchical community structure in networks implemented in MATLAB
L. G. S. Jeub
https://github.com/LJeub/HierarchicalConsensus (2017–2018)

MultilayerBenchmark: A generative model for mesoscale structure in multilayer networks implemented in MATLAB
L. G. S. Jeub, M. Bazzi
https://github.com/MultilayerBenchmark/MultilayerBenchmark (2016–2017)

LocalCommunities: MATLAB implementation of local community detection methods and network community profiles
L. G. S. Jeub
https://github.com/LJeub/LocalCommunities (2014–2018)

SpringVisCom: Visualisation of single-layer and multilayer networks emphasising community structure using charged-particle spring systems implemented in MATLAB
L. G. S. Jeub
https://github.com/LJeub/SpringVisCom (2014–2018)

GenLouvain: A generalized Louvain method for community detection implemented in MATLAB
L. G. S. Jeub, M. Bazzi, I. S. Jutla, P. J. Mucha
https://github.com/GenLouvain/GenLouvain (2011–2017)

Skills

Programming: MATLAB, C/C++, Python, SQL
Computing: Experience using large compute clusters
Writing: Latex

Refereeing

Refereed papers for the following journals: Physical Review Letters, Physical Review E, New Journal of Physics, The European Physical Journal B, EPJ Data Science, Physica A, The IMA Journal of Applied Mathematics, The European Journal of Applied Mathematics, Bioinformatics, Network Science, ACM Transactions on Knowledge Discovery from Data, IEEE Transactions on Network Science and Engineering, Journal of Machine Learning Research, International Journal of Computational Science and Engineering

Refereed a chapter for the book Dynamics On and Of Complex Networks, Volume 3

Teaching

Tutorials for visiting students, St Peter's College, University of Oxford
Networks (Trinity 2016)

Retaining Fee Lecturer, Somerville College, University of Oxford
(2013–2014)
Tutorials for 1st years:
Dynamics, Fourier Series and PDEs, Multivariable Calculus
Tutorials for 2nd years:
Differential Equations 1 & 2, Numerical Analysis, Graph Theory

Teaching Assistant, Mathematical Institute, University of Oxford
C6.3b: Applied Complex Variables (Hilary 2012 & 2013)
B5a: Techniques of Applied Mathematics (Michaelmas 2011 & 2012)

Outreach

Teach network science to teenagers
Aim: Get teenagers interested in network science in particular and mathematics more generally
Format: Short introductory talk followed by interactive sessions on different topics related to network science
My contributions: I was involved in developing the session plans and have led sessions at many of the events we organised in Oxford and at different schools in the UK.
Reference: Commentary: Teach network science to teenagers
H. A. Harrington, M. Beguerisse-Díaz, M. P. Rombach, L. M. Keating, M. A. Porter
Network Science 1:02, 226–247 (2013)