Quentin CAUDRON

Postdoctoral Research Associate, Grenfell Group
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Research Interests

The application of mathematical and computational methods to the analysis of disease dynamics and pathogen ecology. My current research focuses on the study of the spread of measles in small populations, using dynamical systems, time series analysis, and Bayesian inference methods. In addition, I am developing image processing algorithms for the extraction of structural and textural information from histopathology slides, integrating machine learning techniques for increased accuracy and automation.

Education

PhD	Complexity and Computer Science, University of Warwick, 2013
Thesis :	Neuronal Computation on Complex Dendritic Morphologies
Supervisor :	Dr. Yulia Timofeeva, Centre for Complexity Science, University of Warwick
Award :	Full EPSRC Scholarship
MSc	Complexity Science (*Distinction*), University of Warwick, 2009
Award :	Full EPSRC Scholarship
BSc	Chemistry with Management (*Hons*), University of Warwick, 2008

Publications

Q Caudron, A S Mahmud, C J E Metcalf, M Gottfreðsson, C Viboud, A D Cliff, B T Grenfell
Predictability in a highly stochastic system : final size of measles epidemics in small populations
Journal of the Royal Society Interface, **12** (102), 2015.

T P Van Boeckel, A Ashok, K Walters, **Q Caudron**, R Laxminarayan, B T Grenfell, S A Levin
Global trends in antibiotics use 2000 - 2010
The Lancet Infectious Diseases, **14** (8), 2014.

Q Caudron, C Lyn-Adams, J A D Aston, B G Frenguelli, K G Moffat
Quantitative assessment of ommatidial distortion in Drosophila melanogaster
Drosophila Information Service, **96** (136), 2013.

Q Caudron, S R Donnelly, S P C Brand, Y Timofeeva
Computational convergence of the path integral for real dendritic morphologies
Journal of Mathematical Neuroscience, **2** (11), 2012.

Q Caudron, R Garnier, A Graham, B T Grenfell
Automated structural analysis of Soay sheep liver through image segmentation
In preparation, Methods in Ecology and Evolution.

R Garnier, **Q Caudron**, A Graham, J Pemberton, B T Grenfell
Immunodeficiency, malnutrition, and liver degeneration in Soay sheep
In preparation, PLOS Computational Biology.

Current Organisations

Infectious Disease Epidemiology Group
Department of Ecology and Evolutionary Biology, Princeton University
Organiser

Princeton University Python Community
Department of Ecology and Evolutionary Biology, and Department of Geosciences, Princeton University
Founder and Organiser

Skills

Technical

Mathematical modelling, simulation, and analysis using dynamical systems theory, graph theory, statistical inference, and agent-based modelling

Analysis of time series and image data using Fourier and wavelet methods, feature detection, image segmentation, fractal and information-theoretic measures

Extensive experience in algorithm design and implementation in Python, C / C++, and Matlab for deployment on local and high-performance computing systems

Linux, OSX and Windows operating systems; cross-platform development

Linguistic

French and English, native

Spanish and Russian, intermediate

Advising and Teaching

Python for Scientific Computing
Princeton Institute for Computational Science and Engineering, Princeton University
Module Creator and Leader, *October 2010 to December 2012*

Introduction to C and Matlab for Scientific Computing
Centre for Complexity Science, University of Warwick
Module Creator and Leader, *October 2010 to December 2012*

MSc Research Project, *Collaborative Behaviour in Nonequilibrium Population Dynamics*
Centre for Complexity Science, University of Warwick
Main Supervisor, *April to July 2012*

References

Prof. Bryan T. Grenfell
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Prof. Robert S. MacKay
Centre for Complexity Science
University of Warwick
`r.s.mackay@warwick.ac.uk`

Dr. Yulia Timofeeva
Department of Computer Science
University of Warwick
`y.timofeeva@warwick.ac.uk`

Dr. Michael J. Tildesley
School of Veterinary Medicine and Science
University of Nottingham
`michael.tildesley@nottingham.ac.uk`