THOMAS DELANEY

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RESEARCH INTERESTS

Statistical modelling of large scale neural population activity
Statistical hierarchical models of the brain
Information theory in neuroscience
Machine learning models of sensory perception

EDUCATION

University of Bristol Sept 2016 - Present
Candidate for PhD, Computer Science *Bristol, England*

· Biophysical modelling of in-vivo fluorescent calcium indicators.
· Statistical analysis of the activity of large populations of neurons, using information theoretic and network science methods to compare functional clustering of neurons with their anatomical distribution.

University of Edinburgh Sept 2014 - Sept 2015
MSc Informatics *Edinburgh, Scotland*

· Thesis: How informative are retinal ganglion cell responses about visual stimuli?
· Overall Result: Distinction

Trinity College Dublin Sept 2007 - June 2011
BA Mathematics *Dublin, Ireland*

· Final Year Project: Quantum Topos Theory
· Overall Result: 1.1

CONFERENCE PRESENTATIONS

Neural Coding, Computation, and Dynamics Capbreton, France
Poster: Comparing functional clustering to anatomical distribution *September, 2019*

CNS Barcelona, Spain
Poster: Comparing functional clustering to anatomical distribution *July, 2019*

UK Neural computation Nottingham, England
Poster: Comparing functional clustering to anatomical distribution *July, 2019*

COSYNE Denver, CO, USA
Poster: Calcium imaging model *March, 2018*

BNA Festival of Neuroscience Birmingham, England
Poster: Calcium imaging model *April, 2017*

TEACHING EXPERIENCE

University of Bristol Sept 2016 - Present
Teaching Assistant *Bristol, England*

- Teaching Assistant for Computer Science and Engineering Mathematics undergraduate and MSc courses:
  - Applied Statistics, 3rd year & MSc course, 2018 – 2020, $\sim$ 80 students.
  - Machine Learning, 3rd year & MSc course, 2019, $\sim$ 300 students.
  - Data Structures & Algorithms, 2nd year course, 2019, $\sim$ 200 students.
  - Algorithms, 1st year course, 2018, $\sim$ 200 students.
- Marking for undergraduate courses:
  - Algorithms, 1st year course, 2018, $\sim$ 200 students.
  - Computational Neuroscience, 3rd year & MSc course, 2018 – 2019, $\sim$ 300 students.
- Prepared workshop for prospective computer science students on university open day.

University of Bristol January 2017 - Present
Chief Examination Invigilator *Bristol, England*

- Supervised $\sim$ 50 exam rooms.
- Includes exam rooms for a single student and for up to 800 students.
- Responsible for set-up, role taking, reportage of malpractice, safe transport of exam scripts and papers.

TRAINING COURSES

Advanced Computing Research Centre Sept 2018 - Present
Training courses available to University of Bristol students & staff *Bristol, England*

- modern C++
- High performance computing
- Introduction to Modern Fortran
- Version control using Git
- Applied Data Analysis with Python

Online learning Nov 2017 - Feb 2018
Neural Networks for Machine Learning *coursera.org*

- Course designed by Geoffrey Hinton, University of Toronto

PLANNED PUBLICATIONS

Sensitivity of the spikes-to-fluorescence transform to calcium indicator and neuron properties

- Expected to submit to PLOS neuroscience this year.

Functional networks expand across anatomical boundaries as correlation time-scale increases

- Expected to submit this year or early 2021.

PROFESSIONAL EXPERIENCE

CheckRisk June 2018 - September 2018
Research Internship *Bath, England*

- Internship at financial risk assessment company.
- Researched cutting-edge forecasting methods including statistical, machine learning and hybrid methods, including recurrent neural networks.
- Applied these methods to financial data to evaluate domain suitability.

Edinburgh Airport Ltd. Jan 2016 - Aug 2016
Data Engineer *Edinburgh, Scotland*

- Worked as a key member of the Airport's Digital team with a mandate to change every interaction with the airport using technology, data and innovation.
- Main responsibility involved taking in data available from around the business and extracting insights quickly and at low cost.
- Worked with teams such as Commercial, Security, Airfield, Forecasting and Planning to extract, transform and load data, making these datasets useful for these teams, and Edinburgh Airport's senior management.

First Derivatives. Plc June 2011 - Aug 2014
Consultant Software Engineer *Newry, Ireland*

- Worked as a software engineer on in-house projects, and as a consultant for different financial companies and institutions.
- Four months as kdb+ consultant in Morgan Stanley New York offices, working on the creation and upkeep of a large historical and real-time financial database.
- Four months as kdb+ consultant and team leader in off-shore development centre for Morgan Stanley.
- Seventeen months as kdb+ consultant in a highly responsible role in the London based hedge fund Marshall Wace Asset Management.
- Final three months in team-leader role utilising in-house software for performance reporting on First Derivatives FX trading platform.

Trinity College Mathematics Dept. May 2010 - Aug 2010
Summer Intern *Dublin, Ireland*

- Composed a project entitled 'The Historical and Mathematical Development of Maxwell's Equations'.
- Detailed the development of Maxwell's equations from a scientific and mathematical point of view.
- Attended weekly meetings with the project supervisor from the Mathematics Dept.
- Ensured part of this project would be suitable for use in the Classical Field theory or Classical Electrodynamics course in Trinity college.

SCHOLARSHIPS & AWARDS

Bristol PhD studentship, funded by the EPSRC
University of Edinburgh Informatics UK/EU Master's Scholarship 2014/2015, based on application strength
Exemption from Senior Freshman Mathematics Final Exams, Trinity Foundation Scholarship exam results.

TECHNICAL STRENGTHS

Computer Languages	Python, Julia, Matlab, Bash, q/kdb+, Java, c++, Batch Scripting, LaTeX
Protocols & APIs	FIX messaging protocol, Geneos monitoring API
Databases	kdb+, MySQL
Tools	git, SVN, Vim, crontab, Autosys, Eclipse, Scoop for Parallel Processing

OTHER INTERESTS & SKILLS

Spoken Languages	English (fluent), Gaeilge (proficient), French (basic)
Sport	Boxing, Weightlifting, Gaelic games, Association football
Reading	Sport or Maths related non-fiction, Irish fiction, etc.
Gambling Technology	Using my coding and software knowledge to predict the outcomes of games and matches.