

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

Candidate for PhD, Computer Science

Sept 2016 - Present

Bristol, England

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

University of Edinburgh

MSc Informatics

Sept 2014 - Sept 2015

Edinburgh, Scotland

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

Trinity College Dublin

BA Mathematics

Sept 2007 - June 2011

Dublin, Ireland

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

CONFERENCE PRESENTATIONS

Neural Coding, Computation, and Dynamics

Poster: Comparing functional clustering to anatomical distribution

Capbreton, France

September, 2019

CNS

Poster: Comparing functional clustering to anatomical distribution

Barcelona, Spain

July, 2019

UK Neural computation

Poster: Comparing functional clustering to anatomical distribution

Nottingham, England

July, 2019

COSYNE

Poster: Calcium imaging model

Denver, CO, USA

March, 2018

BNA Festival of Neuroscience

Poster: Calcium imaging model

Birmingham, England

April, 2017

TEACHING EXPERIENCE

University of Bristol

Teaching Assistant

Sept 2016 - Present

Bristol, England

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

University of Bristol

Chief Examination Invigilator

January 2017 - Present

Bristol, England

- Supervised ~ 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

Training courses available to University of Bristol students & staff

Sept 2018 - Present

Bristol, England

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

Online learning

Neural Networks for Machine Learning

Nov 2017 - Feb 2018

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 Computational Biology this year.

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

- Expected to submit this year.

PROFESSIONAL EXPERIENCE

CheckRisk

Research Internship

June 2018 - September 2018

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.

Data Engineer

Jan 2016 - Aug 2016

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

Consultant Software Engineer

June 2011 - Aug 2014

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.

Summer Intern

May 2010 - Aug 2010

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, L ^A T _E X
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.

REFERENCES

Dr. Cian O'Donnell	PhD Supervisor
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Dr. Matthias Hennig	MSc Supervisor
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