

# THOMAS DELANEY

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## RESEARCH INTERESTS

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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

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### 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

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### 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

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### 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

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### 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

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### 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

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### **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

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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

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<b>Computer Languages</b>	Python, Julia, Matlab, Bash, q/kdb+, Java, c++, Batch Scripting, L <sup>A</sup> T <sub>E</sub> X
<b>Protocols &amp; APIs</b>	FIX messaging protocol, Geneos monitoring API
<b>Databases</b>	kdb+, MySQL
<b>Tools</b>	git, SVN, Vim, crontab, Autosys, Eclipse, Scoop for Parallel Processing

## OTHER INTERESTS & SKILLS

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

## REFERENCES

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<b>Dr. Cian O'Donnell</b>	PhD Supervisor
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<b>Dr. Matthias Hennig</b>	MSc Supervisor
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