Alexander Bowring

ADDRESS: Apt. 40 Trinity Court, 4 Between Towns Road, Oxford, OX4 3PP
PHONE: +447944 240731
EMAIL: alex.bowring@bdi.ox.ac.uk

Research Interests: Functional Magnetic Resonance Imaging, Analysis Pipelines, Statistical Inference Methods, Open science.

Education

Oct 2017 - Present — DPhil. in Population Health, **The University of Oxford**, Oxford
Thesis: *A Comparison of Neuroimaging Software and a Contour Inference Method for Analysis of Task-fMRI Data.*
Supervisors: *Professor Thomas Nichols, PhD. & Professor Stephen Smith, PhD.*

Oct 2016 - Oct 2017 — PhD. in Statistics, **The University of Warwick**, Coventry
Supervisors: *Professor Thomas Nichols, PhD. & Professor Armin Schwartzman, PhD.*

Sep 2012 - Jul 2015 — BSc. in Mathematics, **The University of Warwick**, Coventry
First Class Honours.
Selected modules: *Galois Theory 88%, Analysis III 90%, Algebra II 86%, Algebra I 80%, Functional Analysis II 78%, Programming for Scientists 89%, Mathematics by Computer 92%.*

Sep 2009 - Jul 2012 — GCE A Levels, **The College of Richard Collyer**, Horsham
A Level results: *Further Mathematics A*, Mathematics A*, Economics A, Physics C.*

Publications

(Preprint) **Bowring A**, Telschow F, Schwartzman A, Nichols TE. Spatial Confidence Sets for Raw Effect Size Images. *BioRxiv* 2019.

Bowring A, Maumet C, Nichols TE. Exploring the impact of analysis software on task fMRI results. *Human Brain Mapping*. 2019.

Maumet C, Auer T, **Bowring A**, ..., Nichols TE. Sharing brain mapping statistical results with the neuroimaging data model. *Nature Scientific Data* 2016.

Pauli R, **Bowring A**, Reynolds R, Chen G, Nichols TE, Maumet C. Exploring fMRI Results Space: 31 Variants of an fMRI Analysis in AFNI, FSL, and SPM. *Frontiers in Neuroinformatics*. 2016.

Selected Conference Presentations

(Oral & Poster Presentation) **Same Data – Different Software – Different Results? Analytic Variability of Group fMRI Results.**, *24th Annual Meeting of the Organization for Human Brain Mapping*, Singapore, June 17-21 2018.
- Winner of a $2,000 OHBM Merit Abstract Award.
- Less than 5% of submitted abstracts chosen for an oral presentation.

(Oral & Poster Presentation) **Spatial Confidence Sets - Beyond Null Hypothesis Testing of Cluster Size**, *23rd Annual Meeting of the Organization for Human Brain Mapping*, Vancouver, Canada, June 25-29 2017.
- Less than 5% of submitted abstracts chosen for an oral presentation.

(Poster Presentation) **Impact of Analysis Software on Replication of fMRI Studies**, *23rd Annual Meeting of the Organization for Human Brain Mapping*, Vancouver, Canada, June 25-29 2017.

(Oral Presentation) **Towards reproducible brain imaging research**, *WIN Annual Conference*, Coventry, January 24 2017.

(Poster Presentation) **Confidence Sets - Going Beyond Voxel-level and Cluster-level Null Hypothesis Testing.** *22nd Annual Meeting of the Organization for Human Brain Mapping*, Geneva, Switzerland, June 26-30 2016.

Research Experience

Nov 2015 - Oct 2016

Research Assistant in Neuroimaging Statistics

Warwick Manufacturing Group

The Instititute of Digital Healthcare, The University of Warwick, Coventry

- Worked alongside Prof. Thomas Nichols and Dr. Camille Maumet to develop standard practices for data sharing and meta-analysis in neuroimaging.
- Extensively analysed neuroimaging data, gaining significant experience of the three main neuroimaging software packages: *SPM*, *FSL* and *AFNI*.
- Made analyses publicly available and provided documentation on my research efforts, becoming familiar with the Github version control system and making use of online data repositories such as Neurovault.
- Mentored a PhD student who visited our lab for three months. Our research during this period was published after peer-review in the journal *Frontiers in Neuroinformatics*, for which I am second author.
- Assisted Dr. Maumet on the *Neuroimaging Data Model* (NIDM), a project dedicated to the development of a standard to share neuroimaging results.
- As part of the NIDM project, proof-read and edited specification documents and tested research prototypes, reporting back on any issues.
- Analyzed data and helped edit a journal article for NIDM, now published in *Nature Scientific Data*, for which I am a coauthor.
- Participated in weekly conference calls with international collaborators, discussing progress and ideas to further develop the NIDM project.
- Conducted my own research into developing a spatial inference method for analysing neuroimaging data under the supervision of Prof. Nichols.
- Created and ran computer simulations to test this method in MATLAB.
- Wrote an abstract describing the method, and gave a poster presentation on this research at the *Organization for Human Brain Mapping* conference in Geneva, Switzerland.
- Communicated daily with Prof. Nichols and Dr. Maumet, and participated in weekly meetings with other post-doctoral researchers and PhD students working in the field at the university.

Jun 2015 - Oct 2015

Research Intern

Undergraduate Research Support Scheme

The University of Warwick, Coventry

- Worked on the project *Visualising the brain - Developing viewers of standardised fMRI results* under the supervision of Prof. Thomas Nichols.
- Analysed neuroimaging data in the neuroimaging software package *SPM*. I used this data to test a research prototype developed by Dr Camille Maumet and made my analyses publicly available online.
- Communicated daily with Prof. Nichols and participated in weekly department meetings with other post-doctoral researchers and PhD students.

Teaching Experience

Jan 2017 - Mar 2017

Statistics Tutor

The University of Warwick

Coventry

- Led tutorials for a group of 20 students taking the ST111 and ST112: Probability A & B undergraduate statistics modules.
- Taught students about the foundational notions of mathematical probability and marked assignments for each module.

Sep 2015

Teaching Intern

Teach First Insight Programme

London

- One of a group of five interns that worked at Cranford Community College, Hounslow.
- Assisted with lessons across a range of subject areas, interacting with students between the ages of 11 and 18.
- Planned and delivered a lesson on prime factorisation to a group of thirty-two Year 8 students.
- Gave a presentation on my experiences at the school to Teach First employees in Canary Wharf.

Further Training

Oct 2017 - Jun 2018 **fMRIB Graduate Programme**
The University of Oxford
Oxford
- Learnt about the scanning and analysis methodologies used for three different modalities of neuroimaging: functional MRI, structural MRI, and diffusion MRI.
- Carried out practical examples using the methods I was taught within FSL.
- Completed an exam at the end of each term. For the MRI Physics and MRI Analysis exams, I achieved scores of 91% and 88% respectively.

Jul 2017 **Bocconi Summer School in Advanced Statistics and Probability**
Lake Como School of Advanced Studies
Lake Como, Italy
- One of 30 international students selected to participate in the summer school.
- Learnt about how statistical causal learning models can provide insight into machine learning tasks such as domain adaptation, transfer learning, and semi-supervised learning.

Dec 2016 - Aug 2017 **Academy for PhD Training in Statistics (APTS)**
Cambridge University, Oxford University, Durham University, Glasgow University
UK
- Completed four residential weeks of training in statistics and probability during the first year of my PhD (one week at each university).
- Learnt about various aspects of statistical modelling, statistical inference and statistical computing across a total of eight intensive course modules.

IT Skills

- **Programming Languages:** MATLAB, Python, bash, JAVA, LaTeX.
- **Neuroimaging Software:** AFNI, FSL, SPM.
- **Version Control:** Git (Github).

References

1. **Professor Thomas Nichols**
Big Data Institute, Li Ka Shing Centre for Health Information and Discovery, Nuffield Department of Population Health, University of Oxford, Oxford, UK.
Email: thomas.nichols@bdi.ox.ac.uk

2. **Doctor Camille Maumet**
Inria, Univ Rennes, CNRS, Inserm, IRISA UMR 6074, Empenn ERL U 1228, Rennes, France.
Email: camille.maumet@inria.fr