Alexander Bowring

Early Career Research Fellow in Neuroimaging Statistics

EMAIL: alex.bowring@bdi.ox.ac.uk
PHONE: +447944 240731
ADDRESS: Big Data Institute, University of Oxford, Oxford, UK, OX3 7LF

Education

Nov 2019 - Present — Early Career Research Fellow in Neuroimaging Statistics, **The University of Oxford**, Oxford
- A 2-year Early Career Research Fellowship awarded by the Nuffield Department of Population Health to research variability in neuroimaging workflows and develop statistical methods for meta-analyses of task-fMRI data.

Supervisor: *Professor Thomas Nichols*

Oct 2017 - Nov 2019 — DPhil. in Population Health, **The University of Oxford**, Oxford
Thesis: *On the Reproducibility and Interpretability of Group-Level Task-fMRI Results*
Supervisors: *Professor Thomas Nichols & Professor Stephen Smith*

Oct 2016 - Oct 2017 — PhD. in Statistics, **The University of Warwick**, Coventry
Supervisors: *Professor Thomas Nichols & Professor Armin Schwartzman*
(Transferred to complete doctorate at The University of Oxford)

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

Bowring A, Telschow F, Schwartzman A, Nichols TE. Confidence Sets for Cohen's *d* effect size images. *NeuroImage*. 2021.

Botvinik-Nezer R, Holzmeister F, ..., **Bowring A**, ..., Schonberg T. Variability in the analysis of a single neuroimaging dataset by many teams. *Nature*. 2020.

Bowring A, Telschow F, Schwartzman A, Nichols TE. Spatial confidence sets for raw effect size images. *NeuroImage*. 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

(Poster Presentation, Upcoming) **Identifying Sources of Software-dependent Differences in Task fMRI Analyses**, *27th Annual Meeting of the Organization for Human Brain Mapping*, Online (due to Covid-19 pandemic), June 21-25 2021.

(Poster Presentation) **Spatial Confidence Sets for Standardized Effect Size Images**, *26th Annual Meeting of the Organization for Human Brain Mapping*, Online (due to Covid-19 pandemic), June 23-July 3 2020.

(Twitter Presentation) **Confidence Sets for Cohen's d Effect Size Images**, *Organization for Human Brain Mapping Equinox Twitter Conference*, Online, March 20 2020.

(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

- Developed standard practices for data-sharing and meta-analysis in neuroimaging as part of the project "Transforming Statistical Methodology for Neuroimaging Meta-Analysis" under the supervision of Professor Thomas Nichols and Dr. Camille Maumet
- 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.

Jun 2015 - Oct 2015

Research Intern

Undergraduate Research Support Scheme

The University of Warwick, Coventry

- Assisted in developing software for visualising neuroimaging results as part of an undergraduate research project "Visualising the brain - Developing viewers of standardised fMRI results".
- 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

Dec 2020

Data Sherpa for Health Data Science Covid-19 Data Challenge

The University of Oxford

Oxford

- Mentored three PhD students in analysing Covid-19 data obtained from Oxfordshire hospitals to investigate the impact of Covid-19 on diabetes and glycaemic control.
- Organised the raw data for the students, where I conducted data cleansing on electronic health records obtained from thousands of hospital patients using Python.

Nov 2020

Statistics Demonstrator

The University of Oxford

Oxford

- Led online tutorials for PhD students enrolled in the graduate Statistics course where I assisted in practical exercises on modern statistical methods and machine learning.
- Taught students the fundamentals of regularised regression and Gaussian predictive models for machine learning.

Oct 2020 **Introduction to Python Course Leader**
The University of Oxford
Oxford
- Ran an introductory course on Python programming for a class of graduate students enrolled in the Centre for Doctoral Training PhD programme.
- Taught students about how to use the fundamental functions and packages needed for programming in Python, including tutorials on the Numpy, Pandas and Scipy packages.

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.
- **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.
   Phone: +44 1865 743590
   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.
   Phone: +33 2 99 84 72 30
   Email: camille.maumet@inria.fr