Samuel **Davenport**

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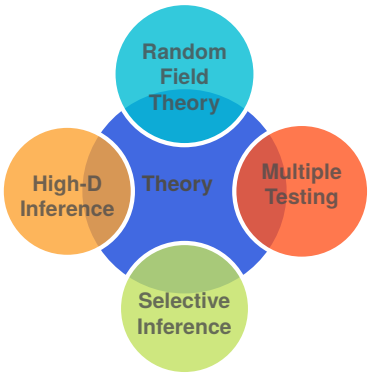
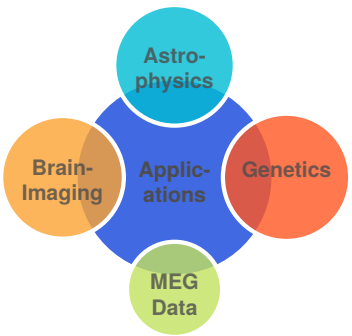
Born
24/03/1994

Citizenship
British and German

Research Interests





Work

2021-Present **University of California San Diego - Postdoctoral research fellow**
Working with Professor Armin Schwartzman developing theory to analyse high-dimensional data with applications in brain imaging.

2021 **University of Toulouse - Postdoctoral research fellow**
Worked with Professors Pierre Neuvial and Bertrand Thirion on post-hoc selection in multidimensional linear models with applications to brain imaging and transcriptomics.

2020-2021 **University of Oxford - Postdoctoral research fellow**
Worked with Professor Thomas E. Nichols on statistical inference using Random Field Theory.

Education

2016-2020 **University of Oxford - DPhil in Statistics on the OxWaSP program**
Supervised by Professors Thomas E. Nichols and Chris Holmes. During the PhD I worked on developing statistical methods for image analysis with applications in Neuroimaging, Astrophysics and beyond. Specializing in Random Field Theory, Multiple Testing and Selective Inference.

2012-2016 **University of Cambridge - BA and Masters in Mathematics**
Distinction, coming 20th in the year out of 240 students and 1st in my college. Thesis on Network Changepoint Detection in fMRI data.

2010-2012 **IB (International Baccalaureate) Diploma: 43/45 points**
Higher Level Mathematics, Physics and Chemistry all 7 (highest mark).

Research Visits

10/19-10/19 **KAUST - King Abdul Salman University of Science and Technology**
I went to Saudi Arabia to visit Professor Hernando Ombao and give a talk on clustersize inference using Random Field Theory.

07/19-08/19 **Technion - Israel Institute of Technology**
I visited Dr. David Azriel in Haifa, Israel to work on convolution random fields and peak detection with Dr. Fabian Telschow and Professor Armin Schwarzman.

01/19-03/19 **University of California San Diego**
I spent 2 months working with Professor Armin Schwarzman at UCSD. We worked on developing confidence regions for the locations of peaks in a random field.

Research

Samuel Davenport, Bertrand Thirion and Pierre Neuvial. FDP control in multivariate linear models using the bootstrap, 2022. In submission.

Samuel Davenport, Thomas E. Nichols and Armin Schwartzman. Confidence regions for the location of peaks of smooth random fields, 2022. In submission.

Samuel Davenport and Fabian JE Telschow. On the finiteness of the second moment of the number of critical points of Gaussian random fields, 2022. In submission.

Fabian Telschow, **Samuel Davenport** and Armin Schwartzman. Functional delta residuals and applications to functional effect sizes, JMVA, 2022.

Samuel Davenport. Statistical Inference in fMRI using Random Field Theory and Resampling Methods, PhD Thesis, 2021.

Samuel Davenport and Thomas E. Nichols. The expected behaviour of random fields in high dimensions: contradictions in the results of Bansal and Peterson (2018), Magnetic Resonance Imaging, 2021.

Samuel Davenport and Thomas E. Nichols. Selective peak inference: Unbiased estimation of raw and standardized effect size at local maxima, NeuroImage, 2020.

Internships

07/16-08/16	**Mercedes and the University of Cambridge** I worked with the Mercedes Racing Team fitting mixed effects models to help understand tyre degradation.
06/15-07/15	**STATSLAB - Department of Statistics at the University of Cambridge** I worked with Professor Chris Rogers on a project that involved analyzing the distribution of financial time series and backtesting statistical trading strategies.
06/14-08/14	**STATSLAB - Department of Statistics at the University of Cambridge** I worked with Professor Nathanael Berestycki on analysis of the adjacent transposition shuffle.

Reviewing

Neuroimage, Journal of Computational and Graphical Statistics, Electronic Journal of Statistics, Human Brain Mapping, Psychometrika and Frontiers in Neuroscience
I have been a reviewer for these journals and in this capacity have reviewed a number of articles on Multiple Testing and Random Field Theory.

Software

Very experienced in Python and Matlab. I currently have a number of openly available packages that I have created and maintain. Several are listed below.

pyperm: This package contains python code to perform inference in high-dimensional linear models using permutation and the bootstrap. In particular it provides post-hoc inference for multiple testing methods when considering multiple contrasts.

RFTtoolbox: The RFTtoolbox contains Matlab code to perform voxelwise RFT analysis, LKC estimation, generation of convolution fields, perform Gaussizianization to improve Gaussianity, provide confidence regions for the location of peaks of random fields and many other features. These can be used to perform multiple testing and general study of multi-dimensional imaging data. Tutorials exploring these features are provided.

Acknowledged in

Blain et al 2022,Bowring et al 2019,Afyouni et al 2019,Teleschow and Schwartzman 2019,Sommerfield et al 2018

Awards

2016	**King's College Cambridge - Part III Mathematics Prize**
2011	**Silver Medal - British Mathematics Olympiad** Came 29th out of around 1100 participants.

Other Interests

I dance competitively (Lindy Hop, Acrobatic Rock n Roll, Salsa and others) and play squash, tennis and ultimate frisbee. I also enjoy cooking and baking.