

# Robert EYRE

## PhD Researcher | Data Scientist

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[📍 Bristol, United Kingdom](#)

Interdisciplinary PhD Researcher at the University of Bristol focusing on computational social science, mathematical engineering and data science. Currently working on understanding human behaviour during natural disasters and pandemics through big data.

## EDUCATION

- 2017 - Present PhD, Engineering Mathematics, University of Bristol. PhD Researcher.  
*Title : Mathematical modelling in urban systems.* (Due to complete September 2021)  
Supervisors : Dr. Filippo Simini, Dr. Nikolai Bode
- 2019 Visiting Researcher, University of Pisa. *One month secondment the University of Pisa to work on a project concerning the migration of scientific researchers and how Brexit has affected decisions to leave the UK.*
- 2013 - 2017 MEng Mathematics and Computer Science, University of Bristol (Award : 1st Class Honours)  
*Masters thesis : The effects of random noise and inhibition on spiking propagation in cortical-like neuronal networks.* Supervisors : Dr. Conor Houghton, Dr. Cian O'Donnell

## PROJECTS

### MOBILITY UNDER COVID LOCKDOWN IN ITALY

2020-

How have visits to places of interest changed under COVID lockdown? In this project I cluster hundreds of millions of GPS traces to find stops at locations extracted from OpenStreetMap. I cluster to find groups of businesses with similar behaviour and measure how each changes before and after the lockdown in Italy.

[python](#) [presto](#) [sql](#) [big data](#) [hive](#) [machine learning](#) [optimisation](#) [data cleaning and manipulation](#)

### HOW DO AREAS RECOVER AFTER NATURAL DISASTER ?

2017 - 2020

[🔗 https://dataforgood.fb.com/tools/businessactivitytrends/](https://dataforgood.fb.com/tools/businessactivitytrends/)

How do areas recover after natural disaster? In this work I collected data from public facing Facebook pages in three cities affected by different natural hazard events. I developed a statistical framework to transform this data into a meaningful signal that can quantify the recovery process of region affected by natural disaster. The results are verified using other indicators and studies of recovery after natural disaster. After publication I collaborated directly with the Data for Good team at Facebook to release Facebook Business Activity Trends, used by nonprofits and aid organisations to target relief.

[apis](#) [facebook](#) [python](#) [statistical analysis](#)

### 'FOOD STANDARDS AGENCY ALERT TRACKER' - JGI DATA CHALLENGE (WINNER)

2020

[🔗 https://roberteyre.github.io/FSAComp/](https://roberteyre.github.io/FSAComp/) [🔗 Link to competition page](#)

I created a d3.js based dashboard to show related food related threats observed by the Food Standards Agency. First placed entry with a £1000 prize.

[d3.js](#) [html](#) [Python](#)

### HOW HAS BREXIT INFLUENCED ACADEMIC RESEARCHER MIGRATION IN THE UK?

2018-2019

I extract mobility data derived from the ORCID platform to form temporal networks describing mobility in and out of research intuitions in the UK. I use statistical physics and build null models to determine anomalous edges in the researcher migration network thought to be associated with Brexit.

[Python](#) [temporal networks](#) [graphs](#) [hypothesis testing](#) [null models](#)

### "IMPROVING OUR ABILITY TO USE ROUTINE DATA TO INFORM THE MANAGEMENT OF KEY DISEASE AREAS" - ALAN TURING DATA STUDY GROUP

2019

[🔗 https://www.turing.ac.uk/collaborate-turing/data-study-groups](https://www.turing.ac.uk/collaborate-turing/data-study-groups)

Project undertook in a Data Study Group with the prestigious Alan Turing Institute. As a team, we partnered with the University of Surrey, and the Royal College of General Practitioners to look at 30 million blood pressure readings, and detect those incorrectly recorded due to bias in rounding the last digit of the readings. In this project I used measures of entropy to estimate the number of incorrectly measured blood pressure readings.

[python](#) [teamwork](#) [data science for good](#) [collaboration](#)

<https://roberteyre.github.io/jgi-lonely/> [Link to competition page](#)

Using loneliness data from The Office for National Statistics (ONS) I investigated how spatial variables such as the number of schools, and quality of GP affects loneliness in a region, using causal analysis (propensity score matching). Second placed entry with a £250 prize.

[python](#) [spatial analysis](#) [causation](#) [propensity score matching](#) [data science for good](#)

## PUBLICATIONS

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2020 Social media usage reveals recovery of small businesses after natural hazard events. Nat Commun 11, 1629 (2020). <https://doi.org/10.1038/s41467-020-15405-7>

## SKILLS

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**Programming** Python, C, Haskell, Julia  
**Databases** MySQL, PostgreSQL, Presto  
**IDE / Development** Jupyter, Visual Studio Code, git  
**Operating Systems** Mac OS X, Windows 10, Linux Centos  
**Other** Microsoft Office suite and MacOS equivalents,  $\LaTeX$ , Public speaking

## TEACHING AND MENTORING

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2018- **Mathematical Methods for Computer Scientists, COMS10003, University of Bristol**  
> First year unit for Computer Science students, where they learn the fundamentals of mathematics needed for the remainder of their degree.  
> Lead Graduate Teacher from 2019 onwards. Additional responsibilities included managing a team of 12 other TAs and running the unit sessions.  
> Graduate Teacher 2018-2019  
[idea dissemination](#) [leadership](#) [public speaking](#) [organisation](#)

## OTHER EXPERIENCE

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2016-2018 **Badminton Social Section Captain, UNIVERSITY OF BRISTOL BADMINTON CLUB, Bristol**  
> Ran badminton sessions for 100 learners and casual players per week.  
> Responsible for player safety and responsibility during sessions.  
> Key team member in recruiting new players during university 'welcome weeks'.  
[teamleading](#) [organisation](#)

Summer 2016/17 **Computer Science Technical Checker / Writer, ZIGZAG EDUCATION, Bristol**  
> Start to finish experience in publishing for school related textbooks and worksheets.  
> Tasked with creating original material to aid in the teaching of KS3 - KS5 Computer Science.  
> Writing full revision material for examinations working closely to the exam-board provided specifications.  
[publishing](#) [educational writing](#)

## REFERENCES

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References available upon request.