Jacob R. Bradley

Pursuing data-driven science to improve outcomes in healthcare

EMPLOYMENT

Inflammatix, Remote – *Machine Learning Researcher*

June 2021 – May 2022

Initially an intern then continuing in a part-time consulting role, I drove forward Inflammatix's gene target identification and validation efforts.

Caspian Learning, UK – *AI Research Intern*

June 2019 – September 2019

As an intern in Caspian's AI R+D team, I used weakly supervised learning approaches to incorporate expert knowledge into predictive systems.

Cambridge Cancer Genomics, UK – *Computational Biologist*

November 2018 – May 2019

During a Master's degree placement, I worked to develop high-dimensional selection methods for identifying genomic markers of resistance to immunotherapy.

Corpus Christi College, Cambridge, UK – *Computing Officer*

March 2017 – June 2018

I was employed by the college to maintain the college's database of student room leases and administer elections.

EDUCATION

University of Edinburgh, UK – *PhD, Statistics*

September 2019 – Present

Thesis title: Statistical and machine learning approaches to genomic medicine.

University of Cambridge, UK – *MSc, Systems Biology*

September 2018 – June 2019

Thesis title: Predictions of response to cancer immunotherapy via tumour mutational burden and genomic resistance markers.

California Institute of Technology, USA – *Undergraduate Research Fellowship*

June 2017 – September 2017

Project title: Mathematical and computational modelling of cell-cell interactions in the Notch pathway.

SKILLS

Machine Learning
tensorflow-probability, keras

Statistical Modelling
Bayesian analysis, causal methods

Computational Biology
Genome-wide and data-intensive 'omics research

Programming
Python, R, SQL

Version Control
Git, CI

AWARDS

Hannan Award (2021) issued by the Institute of Mathematical Statistics for PhD research.

Don Hanson Scholarship (2019) for academic achievement in students from underrepresented UK regions.

Best Research Project (2019) prize for Cambridge's Systems Biology Master's course.

Special Exhibition Award (2018) issued by Corpus Christi College for services to the college.

Boorman Scholarship (2016) for BA examination performance.

Chemistry Olympiad Gold Medal (2015) for A Level students from the Royal Society of Chemistry.

University of Cambridge, UK – *BA, Mathematics*

September 2015 – June 2018

Selected coursework titles: Variable selection and the bias-variance tradeoff; Minimisation of deterministic finite state automata.

PUBLICATIONS AND SOFTWARE

Data-driven design of targeted gene panels for estimating immunotherapy biomarkers – *Nature Communications Biology*

To appear in 2022

This paper, which received the IMS Hannan Prize, details an approach to produce cost-effective gene panels aiding in clinical decisions around immunotherapy. It is currently available on ArXiv.

ICBioMark: Data-driven design of targeted gene panels for estimating immunotherapy biomarkers – *CRAN*

February 2021

R package, available on CRAN and GitHub, to implement the methodology described in the paper above.

Dimensionality and structure in cancer genomics: a statistical learning perspective – *Artificial Intelligence in Oncology Drug Discovery and Development*

September 2020

Invited book chapter published by IntechOpen.

PRESENTATIONS

How cells get hijacked – *3 Minute Thesis Competition*

April 2021

Taking part in the 3MT, I described to a lay audience how cancer can take control of a patient's cells, and how new types of biological data are helping us fight this.

Intelligently designing NGS gene panels – *Festival of Genomics*

January 2021

I presented my work on immunotherapy target gene selection to an audience from academia and industry.

KEY ACADEMIC MODULES

PhD: Causality in Biomedicine; Fundamentals of Cancer; Modern Regression and Bayesian Methods; High-dimensional Statistics.

MSc: Modelling and Analysis of Networks; Synthetic and Executable Biology; Data Acquisition and Handling.

BA: Statistical Modelling; Principles of Statistics; Optimisation and Control; Mathematical Biology; Logic and Set Theory.

VOLUNTEERING

STIMULUS Volunteer Program:
Primary school science demonstrator, teaching year 4/5 pupils about Scratch, Python, and computing safety.

Corpus Christi College:
JCR Students' Union Vice-President
JCR Students' Union Welfare Officer

CONTACT

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