James **Mulhall**

INFECTIOUS DISEASE ANALYST

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Career Objective

I'm passionate about effective altruism and the application of epidemiology, statistics, and data science to global health. I have academic and professional experience in quantitative infectious disease modelling, in additional to a general interest in global priorities research.

Education

MSc Bioinformatics & Computational Genomics
Belfast, Northern Ireland

QUEEN'S UNIVERSITY BELFAST
2020 – 2021

- Result: 1st Class Honours.
- Noteworthy modules below:
- Biostatistical Informatics (94/100): implemented parametric and non-parametric tests, multiple hypothesis testing, study design and power analysis, survival analysis, unsupervised clustering, and dimensionality reduction on various cancer datasets in R.
- Scientific Programming & Statistical Computing (83/100): used Python and R for analysis of patient data, and submitted parallel processing scripts to a Linux-based HPC.
- Systems Medicine from Molecules to Populations (93/100): covered foundations of systems thinking and medicine, built logistical regression and neural networks for breast cancer pattern prediction using UCI ML data, and examined patient stratification using Cox regression.

BSc Pharmacology
Dublin, Ireland

UNIVERSITY COLLEGE DUBLIN
2015 – 2019

- Result: Second Class Honours, Grade I.
- Noteworthy modules: Scientific Data Modelling (A+), Advanced CNS Pharmacology (A), Community, volunteering, and leadership (A).

International Baccalaureate
Maastricht, The Netherlands

UNITED WORLD COLLEGE
2013 – 2015

- Result: 38/45 points.

Work Experience

Demand Model Analyst
London, UK (Remote via Belfast)

UK HEALTH SECURITY AGENCY
Nov 2021 – Oct 2022

- Led development and weekly runs of an Excel- and Python-based PCR demand forecasting sub-model.
- Developed an LFD Positives forecast to aid Contact Tracing.
- Conducted regular and ad-hoc analyses using Tableau and PowerBI dashboards.
- Generated surveillance coverage projections and sequencing forecast reports for genomics stakeholders.
- Maintained and wrote Python and R code to query, visualise, and analyse PCR testing data

Rock Climbing Instructor
Dublin, Ireland

UCD SPORT
May 2017 – Sept 2019

- Coached children and adults to enhance their skills in climbing and ropework.
- Managed large groups of clients, maintaining a safe work environment while providing a central communication point for customer service.

Bartender
Maastricht, The Netherlands

AUX PAYS BAS
July 2016 – Sept 2016

- Developed clear communication and teamwork skills in a high-paced environment.

IT Intern
Aachen, Germany

QUANTA
June 2015 – August 2015

- Overhauled an Excel system for inventory using bar-code labels for fixed assets.
- Assisted in server rack testing and repair.

Publications

Deep learning models for forecasting dengue fever based on climate data in Vietnam
Belfast, Northern Ireland

PLOS NEGLECTED TROPICAL DISEASES
2022

- https://journals.plos.org/plosntds/article?id=10.1371/journal.pntd.0010509
- Van-Hau Nguyen, Tran Thi Tuyet Hanh, **James Mulhall**, Van-Chien Nguyen, Hoang Van Minh, Trung Q. Duong, et al.
- Responsible for writing introduction, developing discussion arguments, and writing majority of discussion. Delegated as main proofreader.

Research Experience

Epidemiological Bioinformatics Research Project
QUEEN'S UNIVERSITY BELFAST

Belfast, Northern Ireland
Jan 2021 – Sept 2021

- Project title: "An early warning system for tropical diseases in Vietnam using Artificial Intelligence."
- Developed SARIMA, LSTM, and CNN prediction models for dengue fever, diarrhoea, and influenza using climate data in Vietnam with Python (libraries including Pytorch, Scikit-learn, Pandas, and Numpy).
- Analysed the impact of climate factors on communicable diseases using Python and the R DLNM package.
- Created visualisations using GeoPandas, Seaborn, and Matplotlib in Python.
- International collaboration with academic and public sector partners in Vietnam.

Pharmacology Research Project
CONWAY INSTITUTE, UCD

Dublin, Ireland
Sept 2018 – Jan 2019

- Result: A-
- Project title: "The characterisation of functional superenhancers during the differentiation of pluripotent cells."
- Gained experience independently working with advanced lab techniques (pluripotent tissue culture, western blotting, fluorescence microscopy, qPCR), using Genome Browser and R, and reviewing modern, expert-level literature in stem cell biology.

Research Internship
CONWAY INSTITUTE, UCD

Dublin, Ireland
June 2018 – Aug 2018

- Antibody validation for OncoMasTR, a breast cancer prognostic biomarker panel.

Leadership & Volunteer Work

Meets Secretary
UCD MOUNTAINEERING CLUB

Dublin, Ireland
Jan 2017 – May 2018

- Independently guided groups of up to 60 on hikes throughout Ireland, and organised the six annual club trips for similar numbers.
- Established strong problem solving abilities through navigation, first aid scenarios, and planning trips on a limited budget.
- Strengthened teamwork abilities through collaborating with a committee of ten to run UCD's largest club.

Training and Safety Officer
NUIG MOUNTAINEERING CLUB

Galway, Ireland
Sept 2015 – May 2016

- Led a successful training grant for €6450. Oversaw safety regulations for the club and organised skills courses for members.

Road Cycling Club Founder
UWC MAASTRICHT

Maastricht, The Netherlands
May 2014 – May 2015

- Founded and ran the club with two other students.

Awards

2016	**Stage 2 University Award**, Awarded a medal for academic merit in stage 2 science.		*UCD*
2015	**Stage 1 University Scholarship**, Awarded a scholarship for academic merit in stage 1 science.		*NUI Galway*
2015	**Bronze Medal**, Irish Climbing Intervarsities		*Awesome Walls*

Skills & Interests

Coding	Python, R, Git, Linux, LaTeX.
Languages	Dutch (B1).
First Aid	Remote Emergency Care level 3.
Guitar	Eight years experience, played for venues of over 500 people.
Mountaineering	Rock climbing and hiking in Ireland, Wales, Spain, and the French Alps.

References

Available on request.