Matthew Knowles

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Education

University of Sheffield Sheffield, UK

MSc, Statistics with Medical Applications *September 2022 – Present*

- Disseration: Network Meta Analysis of Pancreatic Cancer trials using Fractional Polynomials

University of York York, UK

MMath (Hons), Mathematics, Grade: 2:1 *October 2018 – June 2022*

- Focus on Pure Mathematics and Statistics in years 1-3, Specialised in Statistics and Financial Maths in year 4
- Third year project: On Differential Equations in in-host Viral Pathology (70%)
- Final year project: Statistical Methods for Resetting Score Targets in Limited-Overs Cricket (72%)
- Recived full colours for representing the university at cricket

Experience

Statistician June 2022 – Present

OPEN Health Evidence and Access *York, UK*

- Performed and reported on survival analyses of two clinical trials, CLL13 (Multiple Myeloma) and CM-9ER (Rencal-Cell Carcinoma)
- Wrote code to support the delivery of a large Network Meta Analysis for Psoriatic Arthritis
- Gave a talk about outlier detection in Network Meta Analsys, and another about Matching Adjusted Indirect Comparisons vs Simulated Treatment Comparisons
- Developed a Shiny app to interface with a discrete event simulation model
- Worked on building and maintaining in-house R packages for survival analysis and network meta analysis

Research Intern (Mathematical Finance) July 2021 – September 2021

Department of Mathematics, University of York *York, UK*

- EPSRC-Funded research internship
- Working on algorithms for finding convex envelopes of a given set of functions
- Review current and past literature to identify possible improvements
- Implementing algorithms using Python and looking for improvements in efficiency.

Research Intern (Bioinformatics) July 2020 – September 2020

Department of Biology, University of York *York, UK*

- Developed a pipeline in Python for using the Burrows-Wheeler-Aligner and SAMTools to collect, sequence, align and call the peaks of ChIP-Seq data
- Created an R pipeline to apply machine learning libraries to the acquired data
- Identified transcription factors for further study into breast cancer treatment

Research Intern (Particle Physics) July 2017 – August 2017

School of Physics and Astronomy, University of Birmingham *Birmingham, UK*

- Nuffeild Foundation summer research placement
- Using Python to visualise HiSPARC Cosmic ray data through Matplotlib
- Applying statistical methods to the data to locate stars which are potential sources of cosmic radiation
- Presented results at the 6^{th} annual HiSPARC conference at the University of Bath

Projects

Network Meta Analysis of Pancreatic Cancer Trials using Fractional Polynomials June 2023 – Present

- Collected publications on Pancreatic Cancer trials
- Digitised published Kaplan-Meier curves
- Conducting a Bayesian NMA, modelling survival with Fractional Polynomials

Statistical Methods for Resetting Score Targets in Limited-Overs Cricket October 2021 - April 2022

- Wrote python scripts to clean large amounts of match data
- Performed exploratory data-analysis using R
- Built and trained a neural network to predict cricket scores
- Built an R package for reproducible results

Differential Equations in Viral Pathology September 2020 - March 2021

- 3^{rd} year group project, looking at deterministic vs stochastic differential equations, achieved 70%
- Wrote a Python program to graph the evolution of an infection in a host's cells
- Organised, chaired, and took minutes at group meetings.

Skills

Programming Languages: R, Python, C/C++, Stan
Developer Tools: Git, Vim, VS Code, Rstudio Server, Rstudio Desktop
Communicative Languages: **Fluency:** English, Norwegian; **Intermediate:** German, Dutch
Presenting: Experienced at creating and giving talks/presentations in both Beamer and PowerPoint
Other: EXCEL, RShiny, Tidyverse, LaTeX

Professional Memberships

Institute for Mathematics and its Applications

Royal Statistical Society