

# Matthew Knowles

07794235668 | [mk1320@york.ac.uk](mailto:mk1320@york.ac.uk) | [github.com/mattknowles314](https://github.com/mattknowles314)

## RESEARCH INTERESTS

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Through my studies and placements, applied and computational statistics is the field of study I have come to enjoy the most. Particularly, I am interested in working on problems with applications in finance and or medicine.

## EDUCATION

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### University of York

York, UK

*MMath Mathematics, Grade: First (Expected)*

*October 2018 – June 2022*

- Focus on Pure Mathematics in years 1-3, Specialised in Mathematical Finance in year 4
- Third year project: On Differential Equations in in-host Viral Pathology
- Competed for the university cricket club, and sat on the committee as treasurer and vice president
- Club captain for my college's field hockey team in final year

### Droitwich Spa High School and Sixth Form

Worcester, UK

*A-Levels in Maths, Further Maths and Physics, Grades: ABB respectively*

*September 2014 – June 2018*

- Captained the 1<sup>st</sup> XI in field hockey

## RESEARCH EXPERIENCE

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### Research Intern (Mathematical Finance)

Incoming July 2021

*Department of Mathematics, University of York*

*York, UK*

- EPSRC-Funded research internship
- Working on algorithms for finding convex envelopes
- Implementing algorithms using Python and C++

### 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*

- 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<sup>th</sup> annual HiSPARC conference at the University of Bath

## INDUSTRY EXPERIENCE

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### Equities Analyst

November 2020 – January 2021

*The Griff Investment Fund*

*York, UK*

- Largest student lead investment fund in the UK
- Pitched a stock to the fund, with a 15% return on investment since
- Analysis of equities held by the fund, making decisions on whether to buy, hold or sell.

## PROJECTS

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### Data Science Final Project

April 2021 - May 2021

- 3<sup>rd</sup> year data science module final project, achieved 69%
- Implemented decision trees and random forest classifiers
- Performed k-means clustering and PCA analysis
- Soft skills: wrote up the results of analysis in a coherent report.

### Differential Equations in Viral Pathology

September 2020 - March 2021

- 3<sup>rd</sup> year group project, looking at deterministic vs stochastic differential equations
- Wrote a program to graph the evolution of an infection in a host's cells
- Soft skills: organised, chaired, and took minutes at group meetings.

## SKILLS

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**Programming Languages:** Python, C++, R, Java, SQL, HTML/CSS

**Developer Tools:** Git, Vim, VS Code, Rstudio Server, Rstudio Desktop

**Communicative Languages: Fluency:** English, Norwegian **Intermediate:** Russian, German

**Presenting:** Experienced at creating and giving talks/presentations in either Beamer or PowerPoint

## FUNDING

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EPSRC Vacation Internship, July - September 2021

## MEMBERSHIPS

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Institute for Mathematics and it's Applications

Royal Statistical Society