Hugh WARDEN

Data Science | Machine Learning | Statistics | Bioimage Analysis

@ hugh.warden@outlook.com   ○ github.com/hwarden162   ☑ hwarden.com

I am a PhD student at the Institute of Genetics and Cancer, part of the University of Edinburgh. I am very passionate about using my background in machine learning, data science and statistics in a more applied setting, working with a wide range of geneticists and biologists to solve real world problems. Some details of my work may have been omitted if they pertain to unpublished research.

🎓 EDUCATION

August 2025 **September 2021**	PhD Genetics, INSTITUTE OF GENETICS AND CANCER, University of Edinburgh I am currently studying for my PhD in genetics in the Biomedical AI lab at the Institute of Genetics and Cancer, part of the University of Edinburgh. I am interested in single cell morphological profiling, specifically using machine learning to investigate how cancer affects the morphology of cells. I have created my own pipeline to morphologically profile cells from digital pathology slides and I am training a machine learning classifier to recognise the gain and loss of function mutations as well as the time since oncogenesis of the cancer using cellular morphology. `Machine Learning` `Digital Pathology` `Cell Painting` `Bioimage Analysis` `R` `Python` `Julia` `Nextflow`
September 2016 **August 2021**	MMath Mathematics, UNIVERSITY OF SOUTHAMPTON, I graduated from my Integrated Master of Mathematics (MMath) at the University of Southampton with first class honours. I gained an insight into a wide range of mathematical fields and I chose to specialise in data science. To this end I focused on machine learning, statistical modelling and network dynamics as well as computational/programatic skills. Towards the end of my degree I became interested in the application of maths and data science in biology after starting my dissertation in 'The Application of Machine Learning in the Analysis of scRNA-seq Data Sets'. This lead me to also take some biology and medicine related modules as well as completing a masters project in 'The Applications of Hypergraphs in the Analysis of Biological Systems'. `Machine Learning` `Data Science` `Statistics` `Hypergraph Theory` `R` `Python` `Java` `Maths` `Biology` `Genetics`

</> PROGRAMMING LANGUAGES

R	●●●●●
Python	●●●●○
SQL	●●●○○
Groovy	●●●○○
Julia	●●●○○
Javascript	●●○○○
Java	●●○○○

</> FAMILIAR WITH

> Git
> GitHub/GitLab (Including GitHub Actions/CI)
> Mamba/Conda
> Nextflow
> Docker
> Ansible
> CellProfiler
> QuPath

🎵 PERSONAL INTERESTS

I am a keen trumpet player, having played for 18 years. On top of this I also play drums, piano, guitar and bass. I have been a member of multiple bands playing anything from classical or baroque to jazz or show tunes. Over many years I have held multiple roles on the committees for my ensembles, gaining experience in organisation as well as event planning.

As well as participating in multiple ensembles, I also spent a lot of time organising music events. During my undergraduate studies I spent one year as the Performing Arts Music Representative, organising events for 17 ensembles. I also spent one year as the Performing Arts Officer chairing a committee overseeing the running of all 42 of the University's performing arts societies. For both of these years I was a Strategic Board Member for the Turner Sims Concert Hall, Southampton.

I have played badminton for over 15 years. During my undergraduate studies I was a member of the Recreational Badminton Society (one year of which I was treasurer) including travelling to and participating in multiple International Student Badminton Tournaments.

🖥 PERSONAL PROJECT EXAMPLES

RHYPE : A PACKAGE FOR WORKING WITH HYPERGRAPHS IN R
2021 - PRESENT

○ github.com/hwarden162/rhype

I built my own R package for working with hypergraphs in R. It has multiple functions to turn data structures into an R6 hypergraph environment and then multiple functions for manipulating and analysing the hypergraph object. It is currently available to install from CRAN and the developement version is available from GitHub.

| R | Package Developement | CRAN | Hypergraphs |

ACADEMICTHEMES : THEME YOUR PLOTS WITH THE COLOURS OF YOUR ACADEMIC INSITUTION OR FUNDING BODY
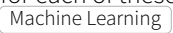MARCH 2023

🔗 AcademicThemes Website   ○ github.com/hwarden162/AcademicThemes

I built an R package that contains layers that can be added to ggplot2 plots to change the colour or fill aesthetic to use the colours of various academic institutions and funding bodies. This allows people to create visually cohesive and memorable posters and presentations. AcademicThemes is available to download from CRAN.

| R | Package Development | CRAN | ggplot2 |

🎓 TEACHING EXPERIENCE

August 2022	Software/Data Carpentry Instructor Qualification, SOFTWARE/DATA CARPENTRIES, The Carpentries
	I achieved my instructor training certificate with the Software/Data Carpentries having been trained in pedagogy with a focus on creating a motivating and engaging environment for learners.
	Teaching Qualification

Present April 2022	Data Science Instructor, ED-DASH, University of Edinburgh
	I work as a workshop instructor and helper for Ed-DaSh who teach software and data skills to other researchers. I am on the team teaching the Introduction to Statistics, High Dimensional Statistics and Introduction to Machine Learning in Python courses. On top of this I have contributed to and help improve the teaching materials for each of these courses.
	Teaching Machine Learning Statistics R Python

Present August 2022	Data Science Instructor, SOUTHAMPTON RESEARCH SOFTWARE GROUP, University of Southampton
	I help instruct the Data Manipulation and Visualization in r course for the Southampton Research Software Group helping equip academics with the technical skills they need to perform their research.
	R Tidyverse Data Manipulation

❝ REFERENCES

Ava Khamseh	Sjoerd Beentjes	Ben MacArthur
PI Khamseh Lab, IGC - EDINBURGH	*PI Beentjes Lab*, IGC - EDINBURGH	*Professor*, UNI OF SOUTHAMPTON
@ ava.khamseh@ed.ac.uk	@ sjoerd.beentjes@ed.ac.uk	@ bdm@soton.ac.uk