

I'm a proficient *pythonista* with a background in mathematics, astrophysics and computer science. Particular expertise in managing machine learning pipelines with large data sets involving time series analysis, computer vision and NLP, in addition to interpersonal skills from a range of hospitality roles. Take a look at my [Portfolio](#) and [GitHub](#) for examples of recent passion projects!

## EMPLOYMENT

**FEB 2022 – NOW** **Innovative Technologies** – Manchester - Remote

POSITION **Machine Learning Engineer**

STACK Python, Pytorch, Keras, Tensorflow, Numpy, Pandas, Sklearn, Matplotlib, Seaborn, Git, Bash

- DUTIES
- [ICU](#) performs accurate age verification to automate associated policy and allow access to age restricted purchases and premises, through an ensemble of various ML algorithms.
  - Implemented bespoke methods from cutting edge research in SVM's, CNN's, and Bayesian Linear Regression which allow for statistically robust age verification.
  - Trained a system of models which allowed for filtering of faces from various spoof attacks, using image segmentation, pose estimation and object detection.
  - Deployed trained models in resource-constrained environments, optimised through quantization.
  - Worked remotely in an agile, communicative, and self-directed manner as part of a collaborative, interdisciplinary, diverse, and geographically-dispersed team.

**JUNE – SEPT 2020** **Facebook (Meta)** – London - Remote

POSITION **Data Scientist, Analytics Intern**

STACK Tableau, SQL, Python, Amazon Web Services, Google Cloud Platform

- DUTIES
- Performed large-scale data analysis to extract useful business insights.
  - Identified the ones which were actionable, suggesting recommendations, and influenced the direction of the business by communicating the results to cross-functional groups.
  - Classified leads so that the team could work on the most valuable cases, and suggested improvements in the tools and techniques to help scale the team.
  - Created dashboards with Tableau on data obtained via SQL queries.

## EDUCATION

**OCT 2021 – 2022** **Data Science** – University of Bath

MSC *Distinction*, Master of Computer Science

DISSERTATION **“Decoding EEG Imagination and Perception Signals”, Neuroscience**

The aim was to explore if decodability of an EEG classification signal depends on an individuals capacity for vivid imagination, presented alongside a comparison of stochastic and deterministic machine learning models.

MODULES **Statistics for Data Science** - Probability and statistics, with a focus on translating real-world problems into a mathematical framework in data science contexts.

**Machine Learning** - Covered both supervised and unsupervised machine learning algorithms from [Bishop](#), including how to develop, evaluate and deploy trained models. The second semester involved advanced techniques focused on [neural networks](#) with both regression and classification.

**Reinforcement Learning** - Implemented various agents to solve [environments](#) from [Sutton & Barto](#), including Dynamic Programming, Temporal Difference and [Deep-Q Learning](#).

**Bayesian Machine Learning** - Implemented [approaches](#) such as bayesian inference, importance sampling, monte carlo, and confidence interval predictions both from scratch and using [bambi](#).

**OCT 2020 – 2021** **Astronomy and Astrophysics** – University of Manchester

MSC *Distinction*, Master of Physics

RESEARCH Published a program to facilitate the data acquisition and analysis pipeline for [TESS](#) automatically, dubbed [firefly](#) (the best Sci-fi show!), which applies nested sampling ([dynesty](#)) to find best fit variables ([transitfit](#)) between the host star and exoplanet.

**SEPT 2016 – 2020** **Mathematics with Computer Science** – University of Nottingham

BSC/MMATH *First-Class Honours*, Master of Mathematics

RESEARCH Dissertation involved working with python to numerically solve [spherical cavitation bubble collapse](#).

**SEPT 2014 – 2016** **Space Engineering** – Loughborough College

A-LEVELS *Mathematics A\* · Further Mathematics A · Physics A · Engineering A*

A specialised course focused on Engineering with guest lectures at the Space Centre in Leicester.

## GENERAL TECH STACK

LANGUAGES	Python, C++, SQL, $\text{\LaTeX}$
PACKAGES	Numpy, Pandas, SciPy, AstroPy
ML PACKAGES	Sklearn, Tensorflow, PyTorch
DATA VIZ	Tableau, Seaborn
SCIENTIFIC	Matlab, R, Fortran, Mathematica
CLOUD	GCP, AWS

## AWARDS AND QUALIFICATIONS

2022	DataCamp: Data Science Track
2022	AWS DeepRacer Student
2021	Kaggle Competitions
2020	Tableau Desktop Specialist
2016	Full UK Driving Licence
2015	Grade 8 Violin

## PUBLICATIONS

2020 - Now **SPEARNET** – *University of Manchester*

Actively contributing to exoplanet detection in the [spearnet](#) collaboration (Spectroscopy and Photometry of Exoplanetary Atmospheres Network). Spearnet is a UK-Thai collaboration which is using a heterogeneous telescope network to select and follow-up exoplanet transiting systems.

AUTHOR [Charles, S. and Wilson, H. \(2022\)](#) “Decoding EEG Imagination and Perception Signals”, 1–91.

[Charles, S. and Scase, M. \(2019\)](#) “On the Derivation of Bell-Plesset Instability.”, 1–19.

[Charles, S. and Louko, J. \(2018\)](#) “Special Relativity in a Periodic Universe.”, 1–73.

CO-AUTHOR [Wilson, H., Golbabe, M. et al. \(2023\)](#) “EEG-based BCI dataset of Semantic Concepts for Imagination and Perception Tasks”, 1–13.

[Hayes, J., Kerins, E., Morgan J. et al. \(2021\)](#) “TransitFit: an exoplanet transit fitting package for multi-telescope datasets and its application to WASP-127 b, WASP-91 b, and WASP-126 b”, 1–14.

## ACADEMIC WORK EXPERIENCE

AUTUMN 2018 **Scholarship** – *National University of Singapore*

SCHOLARSHIP Obtained a scholarship to study a crash course in Korean language for 5 weeks and to learn about the culture and history of the changing landscapes of Singapore. Upon completion, applied to spend the Autumn semester here successfully.

SEPT 2017 - 2019 **Physics Outreach** – *The University of Nottingham*

OUTREACH I began, on a voluntary basis, promoting physics via social media which eventually evolved into a paid role in which I mediated with events staff in the department to ensure successful participation. Part of the role was ensuring inclusivity, and how best to target minority groups.

SUMMER 2018 **Magical Maths** – *St Mary's Catholic Primary School, Nottingham*

OUTREACH Organisation of weekly sessions to promote mathematics to primary school children, in line with the national curriculum.

SUMMER 2014 **Research Intern** – *Space Research Centre, The University of Leicester*

INTERN During my first college year I gained work experience at the University of Leicester Space Research Centre, assisting in the development of an astrobiology rock-sampling tool called [SPLIT](#) for use on Mars.

## INTERESTS

**PHOTOGRAPHY** Avid adventurer and keen astronomer. This hobby pushes the boundaries of my interest in both.

**HIKING** Exploring the peaks, lakes and anywhere with hills. Love to spend weeks away camping.

**MUSIC** Self taught Guitar, Piano, Violin.

**ART** Into optical illusions like the works of Escher, Bridget Riley etc.

**LITERATURE** Love the classics, Jules Verne, H.P. Lovecraft, H.G. Wells etc.

**GENERAL** Into Sci fi and anything spacey!