

# James Briant

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## Education

- 2021 - Present **PhD Statistical Science**, *University College London*, Supervisors: Prof. Serge Guillas (UCL), Dr. Emma Simpson (UCL), Prof. David Jackson (Met Office).
- Bayesian Calibration methods for exascale computer simulations.
  - Topics include Bayesian optimisation, Gaussian Process emulation, Hamiltonian Monte Carlo methods and numerical weather prediction models.
  - PhD project is part of the UCL Met Office Academic Partnership (MOAP) agreement seeking to bring the latest data science research to weather and climate forecasting.
- 2017 - 2021 **MMath Mathematics with Statistics**, *University of Nottingham*, Supervisor: Prof. Theodore Kypraios, Classification: First.
- Dissertation: Inference for Partially Observed Stochastic Processes.
  - 4th year modules include Uncertainty Quantification (89%) and Scientific Computing & C++ (84%).
  - 3rd year modules include Multivariate Analysis (87%) and Applied Statistical Modelling (80%).
- 2015 - 2017 **A-Levels**, *Wyke Sixth Form College*, Hull.
- Mathematics, Further Mathematics, Physics: A\*AA respectively.
  - Chemistry AS: A; Political Extended Project Qualification: A\*.
- 2010 - 2015 **GCSEs**, *Howden Secondary School*, East Yorkshire.
- 12 GCSEs all grade C+ including Mathematics: A\*, English: B.

## Research Projects

- Oct 2021 - Present **Upper Atmosphere Modelling through with Uncertainty Quantification.**
- Gaussian Process emulation and Bayesian Calibration of the Met Office's developments into extending their models to the upper atmosphere.
  - Huge computational requirements to run, design experiments and emulate the weather forecasts model.
  - Project with Prof. Anasuya Aruliah (UCL), Prof. David Jackson (UK Met Office) and Prof. Serge Guillas (UCL).
- Jan 2023 - Present **Machine Learning and Climate Model Fusion.**
- Developing a novel method to improve representation of cloud formation in climate models. Method changes simulated climate and reduces bias in hindcasts.
  - Pre-trained Gaussian Processes learn temperature and specific humidity fields from high resolution weather forecast. During climate model run-time, GP predictions add perturbations to climate model fields.
  - Project with Dr. Dan Giles (UCL), Dr. Cyril Morcrette (UK Met Office) and Prof. Serge Guillas (UCL). Initial paper being readied for submission in Summer 2023.
- Aug 2023 - Present **Bayesian Calibration for Exascale Simulation Models.**
- Extend Kennedy & O'Hagan (2001) Bayesian Calibration framework to employ advanced MCMC techniques for complex simulation models.
  - Project with Dr. Matt Graham (UCL), Dr. Mariya Mamajiwala (Sheffield) and Prof. Serge Guillas (UCL).

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## Academic Experience

- Jul 2023 **Paper Presentation**, *Fusing Simulation with Data Science Workshop*, University of Warwick.
- Presented novel method for fusing Gaussian Processes with weather and climate models to improve cloud representations.
- Oct 2021 - May 2023 **Journal Club Officer**, *AI Society*, UCL.
- Organised a journal club within UCL's student run AI society.
  - Hosted internationally recognised researchers including Prof. Marc Deisenroth (UCL), Prof. Andrew Davison (Imperial) and Dr. Raphael Köster (DeepMind).
  - Assisted with organising ClimateHack.ai in Spring 2022, the inaugural student-run climate-themed hackathon.
- Jul 2020 - Aug 2020 **Research Assistant**, *School of Mathematical Sciences*, University of Nottingham, Supervisor: Dr. Rowland Seymour.
- Used Bayesian non-parametric models to estimate poverty in Dar es Salaam, Tanzania.
  - Contributed towards R package BSBT available on CRAN.
  - Developed efficient algorithms incorporating the Bradley-Terry model to allow for rapid simulations using large volumes of data.
- Jul 2019 **Machine Intelligence & Robotics**, *Shanghai Jiao Tong University*, Shanghai, China.
- Attended 3-week summer programme which introduced theories and methods in AI and machine learning.
  - Travelled around Shanghai exploring the culture, food and history.

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## Additional Experience

- Jul 2023 **Data Detectives**, *Department of Statistical Science*, UCL.
- Facilitated week-long workshop introducing A-level students to R and RStudio.
  - Discussed university life and promoted academia through my experiences.
- Sept 2018 - Jun 2021 **Student IT Support**, *IT Services*, University of Nottingham.
- Provide support to students by resolving issues related to the university's IT services.
  - Work with Microsoft to promote the use of Microsoft Teams within university.
- Sept 2018 - Jun 2019 **PASS Leader**, *School of Mathematical Sciences*, University of Nottingham.
- Peer Assisted Study Support leaders provide academic support for first year undergraduates through timetabled fortnightly problem classes.
- Apr 2019 **Spring Week**, *BNP Paribas*, London.
- Attended workshops and training sessions gaining exposure to the finance industry.
- Oct 2017 - May 2018 **Pint of Science 2018**, *STEM Outreach Society*, University of Nottingham.
- Organised 3 nights of talks in a local pub that delivered latest academic research to the public.

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## Programming & Technologies

Advanced Python, R

Intermediate Docker, Git, LaTeX, SQL, HPCs

Learning C/C++

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## Interests

Programming; basic electronics; science and technology; current affairs; travelling; Formula 1 and Formula E; swimming.