Drew Springham

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EDUCATION & QUALIFICATIONS

PhD Computer Science – King's College London **2023-2027 expected**

"Fair Social Choice under Incomplete Information"

Researching proportional voting methods where full information about voter's preferences are not known. Funded as part of the Safe and Trusted AI CDT.

MSc Advanced Computer Science - University of Oxford **2021-2022**

Distinction, scoring 83% for the dissertation.

Received the Hoare MSc project prize for best MSc project (dissertation) of the year from the Computer Science department. Received a prize from Hertford College for "exceptional performance".

Modules: Computational Game Theory, Computational Complexity, Probability and Computing, Artificial Intelligence, Quantum Computation and Processes, and Category Theory.

BSc Mathematics and Computer Science - University of Bristol **2018-2021**

First Class Honours, scoring a weighted average of 87% over the course.

Select modules: Introduction to Algorithms (98%), Functional Programming (95%), Data structures and Algorithms (93%, confirmed highest mark in year group), Individual Short Project (88%).

A-Levels - Brighton, Hove & Sussex Sixth Form College **2016-2018**

Computer Science A*, Mathematics A*, Further Mathematics A*, Physics A*.

RESEARCH EXPERIENCE

- Master's thesis ("Participatory Budgeting with Conflicts and Partial Information"):
  - Generalised and developed an extension to a participatory budgeting voting model using game theory.
  - Implemented voting algorithms in Python to operate with the extended model and benchmarked the algorithms' performances on real-world data.
  - Developed method of randomly polling voters to ensure that election outcomes are approximately fair with high probability without sampling whole electorate.
  - Simulated the sampling method on real-world election data to show that method could be used to ensure approximately fair results in practice.
- Final year undergraduate project ("Implementing a redistricting algorithm"):
  - Successfully implemented an algorithm for computing fair voting districting schemes in Python.
  - Theoretical algorithm outline was described in preprint paper but required experimentation and innovative ideas to practically implement.
  - Conducted benchmarking on real-world instances, and approximation analysis.
  - In feedback, supervisor said "achievement is on par with a good early-stage PhD student."
- Special interest discussion groups: Presented key concepts from academic papers at discussion groups to PhD students, lecturers, and high-achieving students. Developed critical research skills.

WORK EXPERIENCE

Darktrace, Cambridge | Software Engineer **Nov 2022 – Sep 2023**

- Implementing a range of automated simulated email phishing attacks as part of the wider product to improve cybersecurity awareness within organisations.

Immersive Labs, Bristol | Cybersecurity Intern **Jul 2021 - Aug 2021**

- Personally created upskilling labs as part of interactive training series, subsequently published on the platform.

Computer Science Dept., Univ. of Bristol | Teaching assistant **Oct 2020 – Dec 2020**

Weekly tutorial problem class sessions for second-year module.

- Instructed problem classes for Algorithms II module.
- Online sessions for 10 students at a time, teaching key problem-solving and algorithmic skills, as well as weekly meetings with other teaching assistants to discuss teaching techniques.
- Feedback from students and module leader suggests I am an engaging and effective teacher, with an ability to communicate important concepts concisely. Module leader stated that I was “TAing at a level [he’d] expect from a PhD student”.

Bank of England, London | Cybersecurity data analytics Intern **Jul 2020 - Aug 2020**

8-week internship with the Cybersecurity department, developing data dashboards.

- Developed series of informational dashboards in Tableau to inform wider department and Bank of its current cybersecurity posture.
- Presented how dashboards could be used to increase security accountability to the whole cybersecurity department. Head of department was impressed to the extent that a full-time position at the Bank created to expand upon the work I piloted.

CyberFirst, Scarborough | CyberFirst Academy Student **Jul 2019 - Aug 2019**

ADDITIONAL SKILLS AND EXPERIENCE

- Programming languages: Python 3, Haskell, C, C#, Java, SQL.
- Tools: Git, GitHub, Docker, Azure DevOps, SQL Server Management Studio, Tableau, Microsoft Office.
- Personal programming projects: Created a ledger system to keep track of money amongst friends. Learnt basics of front-end development in JavaScript, experience with HTML and CSS. Created automated Facebook and Twitter pages using respective APIs. Created a Brownian motion simulator in Python 3 to investigate effects of various functions on Brownian motion, including plotting and resolution updating.
- Scientific writing and documentation: Proficient in the use of LaTeX typesetting. Experience in writing system documentation for dashboards created during Bank of England internship.

INTERESTS

I enjoy walking and exploring my surroundings which helps me remain focused. I find great pleasure in discovering places of interest, hidden treasures in my local area that otherwise go unnoticed. Other interests include skiing, paddle boarding, bouldering and live music.