Oliver Paynter-Jones

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Education

University of Bath **Oct. 2022 – Present**

MComp (Hons) Computer Science and Mathematics, predicted First

- Principles of Programming (84%), Data Structures and Algorithms (74%), Artificial Intelligence (75%), Mathematics: Analysis and Algebra (65%), Foundations of Computation (82%), Functional Programming (81%)

Christ the King College, Isle of Wight **Sept. 2015 — Jul. 2022**

A-Levels

- Further Mathematics (A*), Mathematics (A*), Computer Science (A*), Economics (B)
- EPQ: Optimising education from a student's perspective (A*)

GCSEs

- 8 grade 9s, 2 grade 8s

Experience

Marina Staff **Jun. 2023 – Oct. 2023**

East Cowes Marina *East Cowes, Isle of Wight*

- Demonstrated effective leadership and communication skills by working with the marina team to plan, coordinate, and direct boat berthing in challenging weather conditions, ensuring the safety of customers, and protecting marina property
- Managed customer interactions and transactions, demonstrating strong interpersonal skills and the ability to quickly learn and adapt to new software systems
- Regularly conducted safety assessments, addressing potential issues with a keen eye for detail and a proactive approach to maintaining a safe environment

Projects

The Perfect Keyboard: A Genetic Algorithm Experiment | *Python* | Blog

- Developed a genetic algorithm to generate and optimize keyboard layouts for enhanced typing speed and experience
- Utilized frequency data of 246,000 words from Google's book corpus for population evaluation
- Implemented custom crossover and mutation algorithms to evolve the population
- Discovered an optimal keyboard layout that maximises the desirable traits of the perfect keyboard layout

Society Matchmaker | *React, Flask, SQL, Git* | Blog

- Worked in a team of 8 to identify a problem with student-society engagement and conduct interviews with stakeholders
- Took a leadership role in the team, overseeing the system development process and providing tutorials on design, version control, testing, and CI/CD pipelines
- Contributed significantly to frontend development, resulting in a dynamic system with features such as user account management, interest polling, and personalized event recommendations based on user information
- Conducted a statistical analysis of the system and found an average improvement of 150% across two metrics compared to existing systems, indicating increased student engagement

Solving the Rubik's Cube with Group Theory | *Python* | Blog

- Conducted in-depth research to develop a Python-based solver that leverages Group Theory to reduce the search space and increase speed
- Implemented unique encoding/decoding algorithms to create a custom Rubik's Cube data structure
- Applied a modified IDA* search algorithm with search-space pruning to achieve sub-second, near-optimal solutions to any Rubik's Cube scramble
- Created comprehensive documentation to explain the solver's theory and implementation

Speedy Suduko Puzzle Solver | *Python, Jupyter Notebook* | Blog

- Leveraged bitwise data structures and operations to efficiently represent and manipulate puzzle candidate sets, significantly reducing computational overhead
- Used machine-learning techniques to create an backtracking search that uses advanced constraint propagation techniques such as X-wings, swordfish, and unique rectangles, to guide the search with minimal clues
- Benchmarked the solver on a compilation of the most difficult 1500 puzzles and achieved top-tier performance, consistently solving them in under 0.05 seconds

Skills

Languages: Proficient: Python. Intermediate: Java, C, JavaScript, SQL
Developer Tools: Git, VS Code, IntelliJ, Eclipse, Juypter Notebooks
Libraries: Pandas, NumPy, Matplotlib
Technologies/Frameworks: React, Flask, GitHub, JUnit, GitHub Actions