Patrick Hume

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EDUCATION

2020 - 2023	**The University of Manchester** BSc(Hons) Computer Science	(Exp. First Class)

Achieved over 85% in *Programming Languages & Paradigms, Algorithms & Data Structures, Fundamentals of Computer Architecture,* and *Fundamentals of Computer Engineering.*

2018 - 2020	**Jesmond Park West Academy** A-Levels	
	Mathematics	(A*)
	Computing	(A)
	Physics	(A)
	Further Mathematics	(B)
2012 - 2018	**Heaton Manor School** GCSEs	

Six grade 9s including Computer Science, Mathematics, and Physics.
A* in Further Mathematics.

PROJECTS

2023 – Present **HikeUK Web App** *Next, Typescript, React, MUI, Tailwind*

Currently developing a mapping web-app *HikeUK* using Next and OpenLayers, hosted on Vercel and styled with MUI and Tailwind. Using OpenStreetMaps and GraphHopper APIs to display detailed map features and routes. Set up accounts using PostgreSQL and Google Identity's authentication service.

2022 – 2023 **Terrain Generation Application** *C++, OpenGL, GLSL, Eigen*   Documentation.

Developed a terrain generation application in C++ using OpenGL and Eigen which includes: hand-modelling of terrain using gaussian interpolation, increased model realism by simulating rainfall erosion, river and lake generation based on simulation data, automatic texturing, and model exporting to OBJ & GLTF formats. Learnt to manage a large codebase as well as maintain extensive project documentation.

2022 – 2022 **Detail-Based Tessellation Experiment** *C++, OpenGL, GLSL*   Documentation.

Developed a C++ application capable of performing detail-based optimisation of 3D terrain models, using GLSL tessellation shaders to simplify terrain based on their complexity. Increased understanding of low-level OpenGL and GLSL shader pipelines.

2022 – 2022 **Hex Game AI** *C++, Team Project*

Worked with 2 others to develop a C++ application capable of playing the board game *Hex* (an ultra-weakly solved, tile-based board game). Harnessed C++'s memory management tools to produce a performant AI capable of beating a human player. Learnt to create a modular, manageable code-base using inheritance and template classes.

2022 – 2022 **Eventlite Contribution** *Java, Testing, Open Source, Team Project*   Eventlite Repo.

Worked in a team of 7 contributing to Eventlite, an open-source Java code-base. Used Spring to serve data though JSON via RESTful API queries. Additionally implemented front-end features using Thymeleaf to serve dynamic web-pages. Practiced test-driven development, writing custom unit and integration tests using Junit and Hamcrest.

2021 – 2022 **Stendhal Contribution** *Java, Testing, Open Source, Team Project*   Stendhal Repo.

Contributed to a 10,000 line open-source Java code-base in a team of 6 people. Used Eclipse, Ant, JUnit and Jenkins to write unit and integration tests before implementing game-play features. Learnt how to make reasonable time estimates for development as a team.

2020 – 2021 **Micdrop Party Game** *JavaScript, Node, Socket.IO, Bootstrap, Team Project*

Led a team of 7 to develop a browser-based online party game called *MicDrop*. Designed intuitive pages using Bootstrap and Animate CSS. Handled client-server communications using Node and Socket.IO to allow players to join sessions and interact in real time. Increased understanding of client-server programming.

2019 – 2020 **Browser Game Development** *JavaScript, AJAX*   Game & Documentation

Developed a top-down shooter game which runs in the browser. Implemented collision detection, A* path-finding, level-editing, and lighting in JavaScript. Used AJAX to implement level saving and loading from the server. Increased proficiency writing object-oriented JavaScript.

SKILLS

Programming Languages	C/C++, JavaScript, Typescript, Python, Java, PHP, SQL, Unix/Bash, Verilog.
Libraries	(C++) OpenGL, SDL, Eigen, (JS) React, Socket.IO, JQuery, (CSS) Tailwind, Bootstrap.
Frameworks	(JavaScript) Next, (Java) Spring, Spring Boot
Additional Tools	Git, Jenkins