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 – 2023 HikeUK Web App *Next, Typescript, React, MUI, Tailwind* — Live Demo.

Currently developing a mapping web-app *HikeUK* using Next and OpenLayers, styled with MUI and Tailwind. Used OpenStreetMaps and GraphHopper APIs to implement detailed map features and routing. Set up accounts using Google Identity's authentication service.

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

Developed an extensive terrain generation application in C++ using OpenGL and Eigen. Simulated rainfall erosion to add realism to user-shaped terrain. Developed an algorithm to identify and texture rivers and lakes. Implemented model exporting to OBJ & GLTF formats.

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

Wrote a C++ application capable of performing detail-based optimisation of 3D terrain models. 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.

2021 – 2021 3D Renderer *C++, SDL* — Documentation.

Wrote a 3D renderer from scratch using C++ and SDL. Increased understanding of rendering principles, matrix transformations, screen buffering, lighting, and model loading.

2020 – 2021 Online 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 Shooter Game *JavaScript, AJAX* — Live Demo & 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, Bash, Verilog.
Libraries	(C++) OpenGL, SDL, Eigen, (JS) React, Socket.IO, JQuery, (CSS) Tailwind, Bootstrap.
Frameworks	(JavaScript) Next, (Java) Spring