

# Patrick Hume

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## EDUCATION

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- 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

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- 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* [Documentation.](#)  
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 through 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

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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