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# Liam Clegg

I am a highly motivated and skilled 2nd year Computer Science student at Swansea University with a passion for programming. I have demonstrated my technical abilities through various personal and university projects, including developing a ray tracer, a Notion-style editor, a blockchain web application using WebRTC, a video streaming web app, and a jewel chase inspired game. These projects have allowed me to gain valuable experience in software development, problem-solving, and teamwork.

As I move forward in my studies, I am eager to gain industry experience through a summer internship. I am seeking an opportunity to work alongside a professional team, where I can apply my skills and knowledge to real-world projects while learning from experienced mentors. My ultimate goal is to prepare myself for a successful career in software development upon graduation.

## Languages

TypeScript, JavaScript, Rust, Python, Java, C, C++ and SQL.

## Frameworks, Libraries and Databases

ReactJS, NextJS, TRPC, Express, SQL, GraphQL, MongoDB, MySQL, Postgres and Prisma.

## Education

### **Swansea University, Swansea (Currently)** — *Computer Science BSc*

September 2021 - May 2024

### **Davenant Sixth Form, Loughton Essex** — *ALevels*

September 2019 - July 2021

Computer Science (A), Maths (B), Physics (C), EPQ(B)

### **Davenant Foundation School, Loughton Essex** — *GCSE*

September 2014 - July 2029

Maths, English Lang, English Lit, Physics, Biology, Chemistry, Computer Science, History and art.

## Projects

### **Notion Style Editor**

As part of a larger CMS web application project, I developed a Notion-style editor using NextJS and GraphQL. This editor allows users to easily add headings, paragraphs, and images to their content using the Unsplash API. I leveraged TypeScript for the front-end and Rust for the back-end to ensure a robust, efficient user experience. To facilitate communication between the front-end and back-end, I utilised Diesel for the ORM and Juniper with Actix for GraphQL.

One of the key challenges of this project was implementing a secure authentication system. To achieve this, I integrated JWT access tokens with refresh tokens to keep users logged in securely. This allowed users to remain authenticated and access their content with ease.

Through my work on this project, I was able to improve my skills in front-end development, back-end development, and security. Additionally, I gained experience working with multiple programming languages and tools, which I believe will serve me well in my future career.

## Jewel Thief Game

As part of my software engineering module in the first semester of my second year, I worked on a group project to create a Jewel Chase-style game. The project was split into two halves: planning and development.

During the planning phase, we utilised CRC classes and UML diagrams to effectively plan the project. We also learned the importance of regular team meetings and weekly minutes to track our contributions and progress. Through this experience, I gained valuable skills in project planning, team collaboration, and effective communication.

During the development phase, we utilised Git for version control and JavaFX for the UI. We successfully delivered all of the required specifications and even added extra features, such as lighting effects, procedurally generated tiles, and replays. I contributed to the project by setting up the main outline for the engine such as the game loop, keyboard manager and control flow. I also utilised the singleton pattern for the game manager and to make development more simpler for less skilled programmers in my group.

Through this project, I honed my skills in software development, project management, and teamwork. I gained experience in utilising tools such as Git and JavaFX, and I am confident in my ability to contribute to future software development projects.

## Video Streaming Web App

As part of my recent projects, I developed a video streaming site using a modern tech stack, which included NextJS, TRPC, Prisma, and Postgres. My goal for this app was to create a user-friendly interface for streaming torrents. To achieve this, I utilised a torrent searching API and a bit torrent engine to extract and stream video data to the user.

I implemented TRPC to ensure type safety in remote procedure calls between the frontend and backend. Additionally, I created a custom video player component with features such as a video quality toggle, full-screen mode, and picture-in-picture mode. To manage the state of the video player, I created a custom hook called useVideoPlay.

Overall, this project allowed me to showcase my skills in web development, backend programming, and UI design In a super modern web stack.