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Mark Lumb

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Programming Languages and Skills:

Programming languages that I have experience with include: C++, C, C#, OpenGL, Java, SQL, Linux, web development languages, Assembly Language, and Python.

I am familiar with multiple programming techniques and methodologies to achieve a more professional level of development, such as: Object oriented development; Test driven development; Multiple software engineering cycles; Using software version control; Algorithm design and planning using UML diagrams, flow charts and other prototyping techniques; VDM Modelling.

Education:

EDUCATION
2018 – 2022

Newcastle University

MComp Computer Science (Games Engineering)
Not Completed Yet - On track for a First

Sept 2021 – June 2022

Masters Year (Fourth Year) – On track for a First
So far this year, I have completed and am undertaking several more advanced games focused modules all using C++, these include:

Completed modules:

- **Advanced Programming for Games** – Developing a deeper understanding of pointers, references and advanced features of C++, allowing me to produce cleaner, more efficient and more stable code.
- **Advanced Graphics for Games** – Advanced graphical programming to create a tropical island scene using C++ and OpenGL. This involved creating a render pipeline, a scene graph, skeletal animation, writing different types of shaders, post processing effects and more.
- **Advanced Game Technologies** – Creating a physics engine and AI system which works in 3 Dimensions with a variety of features including raycasting, collision detection and response, constraints, spatial acceleration techniques such as octtrees, state machines, AI behaviour trees, pathfinding and pushdown automata.
- **Security Analysis of Complex Systems** – Module about the interaction of social, cyber and physical aspects in complex systems and their impact on the security of the whole system. Aswell as the possible mechanisms to detect, respond to and prevent attacks against complex systems.
- **Engineering Gaming Solutions within a Team** – Tasked to create a Splatoon style game as part of a team of 8, using a custom physics engine we developed off a University framework. Throughout the lifetime of the project, I was part of the Physics, Engine and Gameplay teams where I developed several key features such as the FPS camera controller, sleeping objects, octtrees, adding real game assets into the engine (Evil Genius 2 walls and floors).

In progress modules:

- **Project and Dissertation** – “An Investigation into Machine Learning for Racing Game AI”, creating a project in Unity using the ‘mlagents’ package and several tracks to evaluate the machine learning model and how effectively the AI can adapt to several difficulty of racetracks.

Sept 2018 – June 2021

Bachelor Years (First, Second and Third Year) – First Class Mark
Undertook multiple modules over the three years including a dissertation into creating a procedurally generated infinite terrain using Unity and C#, this achieved a First. I also studied several games focused modules including one which went through implementing the basics of a 2D physics engine in C++ as well as one that introduced the concepts of graphical programming in Unity, receiving a First in both of these modules. I have also undertaken multiple general and security focused modules providing me with experience in a variety of languages.

2011 – 2018
Sept 2016 – June 2018

Harrogate Grammar School

A-Levels

Achieved an A in both Mathematics and an EPQ (Extended Project Qualification); a B in Computer Science and a C in Physics.

Sept 2011 – June 2016

GCSE's and BTEC's

10 A* - B including Maths, Computer Science and Product Design. Distinction in Creative Digital Media Production.

WORK EXPERIENCE

Work Experience:

July – October 2020

Positiply

Was part of the initial start-up team of the company and was the lead algorithm designer and developer.

- Conducted market research to give insights into what young people and employees would want out of the system.
- Aided in business decisions and got an insight into how a new business is started, operates and several key behind the scenes areas.
- Developed the initial database and algorithm designs using UML diagrams and other standard prototyping techniques.
- Advised the business founder as a technical expert to provide him with a greater technical understanding of the different systems behind the website – for example file types behind a website and how that can use an external algorithm.
- Designed and prototyped 2 algorithms for the company, only one of which was decided to be implemented into the initial launch of the site. I then developed and thoroughly tested this algorithm using the agile software approach and unit testing. The algorithm that is used in the site is to calculate peoples feedback rating.

June – July 2016

Treves UK (Tier 1 Automotive supplier, global manufacturer of interior trim and acoustic systems)

Worked for one week as a trainee engineer under the chief engineer and one week in the IT and office department as a customer and supplier liaison

- Streamlined problems to make work easier and more efficient for time constraints, including advancing a waste removal technique that allowed for quicker transportation and removal of the waste build up
- Developed a new interview technique to see if people could follow instructions and execute them in a small amount of time
- Enhanced existing workbenches into new ones to make a more efficient working triangle for an employee, so they wouldn't have to move around as much to do all their tasks making them more efficient
- Quality control and product testing - tested the side boot panels for the new Honda Civic to see if they would fit into the car correctly

References:

Dr Graham Morgan – Acting Head of School of Computing:
graham.morgan@newcastle.ac.uk

Dr Gary Ushaw – Senior Lecturer:
gary.ushaw@newcastle.ac.uk

More available upon request