Kyle Simpson
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5th Year Computer Science student seeking postgraduate positions and graduate work.

RELEVANT EMPLOYMENT EXPERIENCE

October 2016 – Present **Lab Demonstator/Tutor, University of Glasgow**

- Demonstration and assistance for third year and masters classes on Java, C, concurrent programming, compiler design and networks.

July 2016 – September 2016 **Software Development Intern, TBR Global**

- Development of a visual editor in TypeScript/HTML5 and responsive CSS3, with JSON/SVG export.
- Integration of this editor within an ASP.NET MVC booking system, making use of C#, VB.NET and SQL.

June 2016 – July 2016 **Research Intern, University of Glasgow**

- Problem model design, implementation and optimisation in Constraint and Integer Programming paradigms (Choco3 and Gurobi solvers).
- Experimental design and implementation.
- Analysis, presentation and reporting of findings with LaTeX and GnuPlot.

EDUCATION

Sept 2013 – Current **MSci Computer Science (Faster Route), University of Glasgow**

Commenced in September 2013. Excellent grades achieved to date – recipient of the 2014-2015 Year 3 Class Prize and 2015-2016 Year 4 Honours Class Prize. Educational focus in electives has centred on Operating Systems, Networking, Computer Vision and Algorithmics.

Sept 2012 – Sept 2013 **MSci Theoretical Physics, University of Glasgow**

Excellent grades achieved, having also taken the more advanced mathematics modules. Course changed due to interests and employment prospects.

Aug 2006 – June 2012 **Cathkin High School, Glasgow**

Dux Award received in 5th Year.
3 Advanced Highers – *3 A Grades.*
6 Highers – *6 A Grades.*
8 Standard Grades – *8 Grade 1s.*

CORE SKILLS

- Skilled in physics, mathematics, arithmetic and problem solving.
- Willing to adapt and learn from new challenges, with an interest in data science and security.
- Prior academic experience with network designs, security, combinatorial search and optimisation (constraint programming/mixed-integer programming), and graph problems.
- Extended web development experience:
    - Proficient with *WebRTC*, having leveraged the technology to develop peer-to-peer topologies targeting both client- and server-side deployment.
    - Familiarity with *NodeJS* for server application development and as a build platform.

    - *WebGL* and *Canvas* experience from previous game development work.
    - Knowledge of direct DOM manipulation through vanilla JavaScript (without jQuery).
    - *HTML5* and *CSS* design experience, and past usage of static site generators such as *Hugo*.
- Familiar with Object-Oriented and Imperative Programming paradigms in *JavaScript*, *TypeScript*, *Java*, *Rust*, and *C*, with light experience in *C++*. Scripting experience in *Python*, *Bash* and *PowerShell*.
- Extended experience with computers and software systems, in addition to being able to quickly grasp new software and applications and their concepts.
- Able to cooperate and contribute with others effectively in a team working environment, having experience with both *Git* and *SVN*.
- Always eager to learn and to improve skillset.
- Enthusiastic, hardworking, positive and reliable.

INTERESTS

Game Development; I often take part in 48-hour game development challenges, where all participants must adhere to a given theme before judging one another's entry. I enjoy the difficulty of such events, and incorporating others' feedback and the knowledge I gain from each entry allows me to improve upon my future projects.

For additional hobbies I enjoy playing guitar, reading, regular family social evenings and dining out. I also enjoy drawing and sketching, and I've been taking a recent interest in security topics such as pen-testing.

PROJECTS

At present, I am researching applications of modern graph searching algorithms against graph models of images to investigate image similarity and associated computer-vision problems. The work focuses on character recognition by conversion to a labelled graph format, before undergoing similarity comparison by state-of-the-art algorithms. Extensions to more general classes of problem are planned.

Last year, my honours project was to design a messaging application based on a WebRTC implementation of an onion routing layer – ultimately, an implementation for the necessary network stack (WebRTC + Distributed Hash Table + Onion Routing) was completed. Due to the unique constraints WebRTC places upon connections to fulfil the browser security model, implementing existing algorithms and standards as well as designing new systems often demanded a high amount of ingenuity and creativity. A key focus of this project was to ensure the robustness of such a system, resulting in the development of a state machine specifically designed to accommodate WebRTC's connection limitations and semantics. Working on this project also taught me much about security models and resource management – both at the protocol level and at the application layer as well as the difficulties faced when designing systems likely to face malicious users.

In the past, I worked with a team to develop a programming language designed around drawing and creating shapes. Within the team I was responsible for writing and maintaining the shader manager due to my prior WebGL experience, and also maintained the project repository as well as designing the code editor. Afterwards, I redeveloped the compiler for the project from scratch and extensively modified the virtual machine to see the project achieve more of its potential – it is presently in an impressively operable (yet incomplete) state. My roles helped me to gain experience in developing effective abstractions, designing for extensibility, compiler design and implementation.

REFERENCES

References are available on request.

Updated March 2017