

Kyle A. Simpson

Computing Science Ph.D. candidate seeking research/software engineering internships.

RELEVANT EMPLOYMENT EXPERIENCE

October 2016 – Current Lab Demonstrator/Tutor, University of Glasgow

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

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) working with Dr. David Manlove and Dr. Patrick Prosser.
- Experimental design and implementation.
- Analysis, presentation and reporting of findings with LaTeX and GnuPlot.

EDUCATION

2017 – Current Ph.D. Computing Science, University of Glasgow

- Supervised by Dr. Dimitrios Pezaros and Dr. Simon Rogers, “Securing Future Networked Infrastructures through Dynamic Behaviour Profiling”, as part of the Glasgow Systems Section (GLASS).

2012 – 2017 MSci Computing Science, University of Glasgow

- First class honours (equiv. ~4.0 GPA). Recipient of the class prize 2014–2016.
- Educational focus in electives and projects has centred on Operating Systems, Networking, Computer Vision and Algorithmics.
- MSci dissertation, “Graph Models and Maximum Common Subgraph for Character Analysis”, supervised by Dr. John Williamson and Dr. Patrick Prosser.
- BSc dissertation, “Onion-Routed Communication Over WebRTC”, supervised by Dr. Colin Perkins.

RESEARCH AND EXPERIENCE

My present research focusses on trying to combine recent advances in programmable networking (Software-Defined Networking, Network Function Virtualisation) with machine learning techniques for automated threat detection and control. I am currently investigating the suitability of reinforcement learning and other strategies for controlling and observing evolving attacks and notions of normality. The environments introduce the issues of learning from partial data, optimisation of agent locations and distributed learning.

I have contributed bugfixes and performance improvements to high-profile, complex open source projects such as *Open vSwitch* and the *Rust compiler* – I enjoy coming to understand and reasoning about the performance of such large-scale programs. Historically, I have examined applications of modern graph

search algorithms against graph models of images to investigate image similarity and associated computer-vision problems. I have experience and knowledge with combinatorial search and constraint satisfaction from this work and my prior internship. Past work on designing systems around onion routing has given me experience in robust network modelling and design. Outside of this, I have peripheral interests in computer graphics, rendering, game development and compilers.

CORE SKILLS

- Skilled in programming, mathematics, arithmetic, scientific writing and problem solving.
- Prior academic experience with overlay network design, security, combinatorial search, optimisation (constraint programming/mixed-integer programming), and graph problems.
- Practical reinforcement learning experience in Python, with relevant theoretical background. Knowledge of more traditional machine learning approaches and algorithms.
- 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.
 - *HTML5* and *CSS* design experience, and past use of static site generators such as *Hugo*.
- Familiar with *JavaScript*, *TypeScript*, *Java*, *Rust*, and *C*, with moderate experience in *C++*. Scripting experience in *Python*, *Bash* and *PowerShell*.
- Able to cooperate and contribute with others effectively in a team working environment, having experience with both *Git* and *SVN*.
- Enthusiastic, hardworking, positive and reliable.

PUBLICATIONS

- “On Maximum Weight Clique Algorithms, and How They Are Evaluated”, *Ciaran McCreesh, Patrick Prosser, Kyle Simpson, James Trimble*. (CP2017)

REFERENCES

References are available on request.

Updated October 2018