Kyle Simpson

Curriculum Vitæ

Sir Alwyn Williams Building
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University Education

since 2017 **PhD Degree in Computing Science**, *University of Glasgow*, Scotland.
Supervisor: Prof. Dimitrios P. Pezaros

Thesis (ongoing): *Programmable, Data-driven Networks for the Masses*

Tutor (see *Teaching* section)

Research Community integration (see *Research Community Activities* section)

2012–2017 **MSci Degree in Computing Science**, *University of Glasgow*, Scotland.

Grade: **1st Class Hons** (highest grade). Equivalent to combined BSc Hons and MSc.

Class prize—highest overall grade in years 3–5.

MSci Thesis: *Graph Models and Maximum Common Subgraph for Character Analysis*

BSc Thesis: *Onion-Routed Communication Over WebRTC*

Professional Experience

2019–2020 **Affiliate**, *Lawrence Berkeley National Laboratory*, USA (CA).
I led investigation into flow classification on high-speed networks using state-of-the-art machine learning models and programmable network hardware. Work to be presented at IEEE GLOBECOM 2020.

2019 **Research Intern**, *ESnet, Lawrence Berkeley National Laboratory*, USA (CA), 3 months.
I undertook the design, implementation, and testing of software written in Go for high-throughput stateful traffic analysis in the future design of a large-scale WAN. This included modification of programmable switch firmware, deep analysis of the network stack, and close integration with operations staff. Presented at IMC 2019.

2016 **Research Intern**, *University of Glasgow*, Scotland, 2 months.
Problem model design, implementation and optimisation in Constraint and Integer Programming paradigms (Choco3 and Gurobi solvers), working with Prof. David Manlove and Dr. Patrick Prosser.

Awards and Scholarships

2017 **EPSRC PhD Scholarship**, *approx. £63,500.*
Engineering and Physical Sciences Research Council (EPSRC) funded PhD (3.5 years) at the University of Glasgow.

2015–2017 **Class Prizes**, *£100 ea.*
Awarded to the student with the highest GPA in **Level 3** (18.8/22.0), **Hons** (20.7/22.0), and **MSci** (20.3/22.0)

Research Community Activities

Program Committees & Reviewing

- **Shadow Program Committee**: ACM EuroSys 2021.
- **External reviewer for conferences**: IEEE ICC (International Conference on Communications), IFIP Networking, IFIP/IEEE IM (International Symposium on Integrated Network Management), and IEEE INFOCOM (International Conference on Computer Communications).
- **External reviewer for journals**: Elsevier Computer Networks, and IEEE Communications Letters.

Research Networks

- Member of the IEEE (ComSoc and Young Professionals), the UK Many-core Research, Innovation and Opportunities Network (MaRIONet), the Networked Systems Research Laboratory (Netlab) at the University of Glasgow, and regular participant of the SCOttish Networking Event (SCONE).

Publications

2020 [1] **Kyle A. Simpson**, Richard Cziva, and Dimitrios P. Pezaros. "Seiðr: Dataplane Assisted Flow Classification Using ML". In: *2020 IEEE Global Communications Conference: Next-Generation Networking and Internet (Globecom2020 NGNI). To appear*. CORE 2020 Ranking: B. Taipei, Taiwan, Dec. 2020.

[2] **Kyle A. Simpson**, Simon Rogers, and Dimitrios P. Pezaros. "Per-Host DDoS Mitigation by Direct-Control Reinforcement Learning". In: *IEEE Trans. Netw. Serv. Manag.* 17.1 (2020). SJR **Ranking: Q1**, pp. 103–117.

2017 [3] Ciaran McCreesh, Patrick Prosser, **Kyle Simpson**, and James Trimble. "On Maximum Weight Clique Algorithms, and How They Are Evaluated". In: *Principles and Practice of Constraint Programming - 23rd Interna-*

tional Conference, CP 2017, Melbourne, VIC, Australia, August 28 - September 1, 2017, Proceedings. CORE 2017 **Ranking: A**. 2017, pp. 206–225.

Talks and Presentations

11/2020 **Talk**, *Systems Section Talk*, Sir Alwyn Williams Building, University of Glasgow, Scotland.
Title: Seiðr—Dataplane Assisted Flow Classification Using ML

11/2019 **Talk**, *RSC Internship Workshop*, Sir Alwyn Williams Building, University of Glasgow, Scotland.
Title: Internship Experience and Advice

10/2019 **Poster**, *ACM IMC 2019 (Internet Measurement Conference)*, KIT Royal Tropical Institute, Amsterdam, The Netherlands.
Title: Real-time Performance Analysis of High-Speed, International Science Network Flows

08/2019 **Talk**, Shyh Wang Hall, Lawrence Berkeley National Laboratory, USA (CA).
Title: ESnet6 HighTouch Collector: Overview and Future

08/2019 **Poster**, Shyh Wang Hall, Lawrence Berkeley National Laboratory, USA (CA).
Title: ESnet6 HighTouch Services: TCP at the Nanosecond Scale

02/2019 **Talk**, *Systems Section Talk*, Sir Alwyn Williams Building, University of Glasgow, Scotland.
Title: Improved Direct-Control Reinforcement Learning for DDoS Prevention

09/2018 **Talk**, *SCONE 20 (SCOttish Networking Event)*, Informatics Forum, University of Edinburgh, Scotland.
Title: Improving Direct-Control Reinforcement Learning for Network Intrusion Prevention

04/2018 **Talk**, *Algorithmics Group Talk*, Sir Alwyn Williams Building, University of Glasgow, Scotland.
Title: Reinforcement Learning in Network Defence/Control

Teaching

As a PhD Student at the University of Glasgow

2020–2021
- Teaching Assistant: *MSc Summer Project Support*.
- Teaching Assistant: *Data Fundamentals*, undergraduate course (Level H/M).

2019–2020
- Teaching Assistant: *Data Fundamentals*, undergraduate course (Level H/M).
- Teaching Assistant: *Systems Programming*, undergraduate course (Level H/M).
- Teaching Assistant: *Machine Learning*, undergraduate course (Level H/M).
- Teaching Assistant: *Machine Learning for Data Scientists*, postgraduate course (Level M).
- Teaching Assistant: *Operating Systems*, undergraduate course (Level H/M).
- Teaching Assistant: *Networked Systems*, undergraduate course (Level H/M).
- Teaching Assistant: *Cybersecurity Fundamentals*, postgraduate course (Level M).
- Teaching Assistant: *Programming Languages*, undergraduate course (Level H/M).

2018–2019
- Teaching Assistant: *Quantum Technology and Cryptography Summer School*, introductory lessons for high-school level students.
- Teaching Assistant: *Data Fundamentals*, undergraduate course (Level H/M).
- Teaching Assistant: *Networks and Operating Systems Essentials*, undergraduate course.
- Teaching Assistant: *Cybersecurity Fundamentals*, postgraduate course (Level M).
- Teaching Assistant: *Programming Languages*, undergraduate course (Level H/M).

2017–2018
- Teaching Assistant: *Advanced Programming (IT)*, postgraduate course (Level M).

As an MSci Student at the University of Glasgow

2016–2017

- Teaching Assistant: *Programming Languages*, undergraduate course (Level H/M).
- Teaching Assistant: *Advanced Programming*, undergraduate course (Level H/M).
- Teaching Assistant: *Advanced Programming (IT)*, postgraduate course (Level M).
- Teaching Assistant: *Networked Systems*, undergraduate course (Level H/M).