Soo-Jin Moon

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Research Interests

Computer Network, Computer Security

Education

Carnegie Mellon University — Pittsburgh, PA, USA
Ph.D. in Electrical and Computer Engineering — Sept. 2020
Advisors: Vyas Sekar
Thesis: Practical Black-Box Analysis for Network Functions and Services

University of Waterloo — Waterloo, ON, Canada
BAS.c. in Electrical Engineering — May. 2014
Graduated on a Deans Honour List with Distinction

Honors and Awards

- Greylock X Fellow, Greylock Partners (info) *2020*
- Rising Stars in EECS (link) *2019*
- NSA Best Scientific Cybersecurity Paper (link) *2016*
- Cybersecurity Awareness Worldwide (CSAW) Applied Research Best Paper – Second place (link) *2015*
- Carnegie Institute of Technology Deans Fellow, Carnegie Mellon University *2014*
- Sandford Fleming Awards for Co-operative Proficiency, University of Waterloo (info) *2014*
- Industrial Undergraduate Student Research Awards, Natural Sciences and Engineering Research Council of Canada *2014*
- President's Research Award, University of Waterloo *2012*
- Sandford Fleming Foundation Award for Work Term Report, University of Waterloo *2011*
- President's Scholarship of Distinction, University of Waterloo *2009*
- Nortel Networks Undergraduate Scholarship, University of Waterloo *2009*

Publications

[1] **Soo-Jin Moon**, Yucheng Yin, Rahul Anand Sharma, Yifei Yuan, Jonathan M. Spring, and Vyas Sekar. Accurately Measuring Global Risk of Amplification Attacks using AmpMap. To Appear in the 30th USENIX Security Symposium **(USENIX Security 21)**, August 2021 (Awarded a badge for Artifact Evaluation).

[2] **Soo-Jin Moon**, Yucheng Yin, Rahul Anand Sharma, Yifei Yuan, Jonathan M. Spring, and Vyas Sekar. Accurately Measuring Global Risk of Amplification Attacks using AmpMap (CMU-CyLab-19004). In Tech Report (CMU-CyLab-19004), October 2020.

[3] Yifei Yuan, **Soo-Jin Moon**, Sahil Uppal, Limin Jia, and Vyas Sekar. NetSMC: A Custom Symbolic Model Checker for Stateful Network Verification. In Proceedings of the 17th USENIX Symposium on Networked Systems Design and Implementation **(NSDI)**, February 2020.

[4] Zinan Lin, **Soo-Jin Moon**, Carolina M. Zarate, Ritika Mulagalapalli, Sekar Kulandaivel, Giulia Fanti, and Vyas Sekar. Towards Oblivious Network Analysis Using Generative Adversarial Networks. In Proceedings of the 18th ACM Workshop on Hot Topics in Networks **(HotNets 19)**, November 2019.

[5] **Soo-Jin Moon**, Jeffrey Helt, Yifei Yuan, Yves Bieri, Sujata Banerjee, Vyas Sekar, Wenfei Wu, Mihalis Yannakakis, and Ying Zhang. Alembic: Automated Model Inference for Stateful Network Functions. In Proceedings if tge 16th USENIX Symposium on Networked Systems Design and Implementation **(NSDI 19)**, February 2019.

[6] **Moon, Soo-Jin**, Vyas Sekar, and Michael K. Reiter. Nomad: Mitigating Arbitrary Cloud Side Channels via Provider-Assisted Migration. In Proceedings of the 22nd ACM SIGSAC Conference on Computer and Communications Security **(CCS 15)**, October 2015.
NSA 2016 Best Scientific Cybersecurity Paper
CSAW 2015 Applied Research Best paper (2nd place).

Invited Talks and Conferences

Black-Box Approach to Network Security
- at VMWare Research, Palo Alto, CA (virtual) *Mar. 2020*
- at Amazon Web Services (AWS) Security, Cupertino, CA (virtual) *Mar. 2020*
- at NOKIA Bell Labs, Murray Hills, NJ (virtual) *Mar. 2020*
- at CONIX Student-Liaison Seminar, CMU, Pittsburgh, PA. *Dec. 2019*
- at Rising Stars in EECS, UIUC, Champaign, IL. (talk abstract) *Oct. 2019*

Alembic: Automated Model Inference for Stateful Network Functions
- at USENIX NSDI, Boston, USA. (talk video) *Feb. 2019*

Automatically building a map of amplification-inducing queries to network servers
- at Cyber Autonomy workshop, CyLab, CMU, Pittsburgh, PA. *Oct. 2018*

Nomad: Mitigating Arbitrary Cloud Side Channels via Provider-Assisted Migration
- at Assured Cloud Computer Seminar, UIUC, Champaign, IL. (talk abstract) *Jan. 2017*
- at NSAs Science of Security Quarterly Meeting and Annual Best Scientific Cybersecurity Paper Competition Ceremony, NSA, Laurel, MD.(event agenda) *Nov. 2016*
- at ACM CCS, Denver, CO. *Oct. 2015*

Re-thinking Network Security in the Presence of Black-box Network Elements
- at EuroDW (with European Conference on Computer Systems), Porto, Portugal. *Apr. 2018*

Professional Services

Invited Judge/PC member, Cybersecurity Awareness Worldwide (CSAW) Applied Research (link) *2017*
Invited Judge/PC member, CSAW Applied Research (link) *2016*
Seminar organizer, Cylab Security Student Seminar *June 2016 - Oct 2017*

Professional Experience

Software Engineer, Network Infrastructure, Google LLC *Oct 2020 - Present*
- Working on making Google's network management more seamless and ensuring bits flow uninterruptedly at Network Infrastructure

Graduate Research Assistant, ECE, Carnegie Mellon University *Aug 2014 - Sept 2020*

Worked on various research projects in networking and security [1, 2, 3, 4, 5, 6]
- Built an Internet health monitoring tool to assess amplification risk on the Internet [1].
- Built tools for accurate network testing and verification [5, 3].
- Built a defense mechanism for general defense against cloud side channels [6].

PhD Research Intern, Networking Group, Hewlett Packard Labs *May – Dec 2016*
- Worked on building automated model inference tool for network functions (resulted in [5]).

DSP Algorithm Developer, ON Semiconductor, Waterloo, ON *Sept – Dec 2013*
Hardware Engineer, IGNIS Innovation, Waterloo, ON *Jan – Apr. 2013*
Software Developer, Altera Corp., Toronto, ON *May – Aug 2012*
Software Developer, Canada Pension Plan Investment Board, Toronto, ON *Sept – Dec 2011*
BI/SQL/.NET Developer, OpenText Corp., Toronto, ON *Jan – Apr 2011*

Teaching Experience

15/18-330 Introduction to Computer Security, *Head Teaching Assistant*, CMU *Fall 2018*

Held tutoring sessions for $\tilde{1}00$ undergrad students. Made homework assignment and exam problems. Held weekly office hours.

18-731: Network Security, *Head Teaching Assistant*, CMU *Spring 2016*

Gave lectures on attack graphs and held office hours. Made homework assignments and exam problems.