Kaushal Kafle

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EDUCATION

William & Mary, Williamsburg, VA   August 2017 – June 2024
PhD in Computer Science
Advisor: Dr. Adwait Nadkarni

Pulchowk Campus, Tribhuvan University, Nepal   Nov 2011 - Nov 2015
BE in Computer Engineering

PROFESSIONAL EXPERIENCE

University of South Florida, Tampa, FL   *August 2024 – Present*
Assistant Professor
Department of Computer Science and Engineering

Virginia Department of Education, Richmond, VA   *May 2023 – Aug 2023*
Commonwealth of Virginia Engineering and Science (COVES) Policy Fellow
Mentors: Keisha Tennessee (Virginia Computer Science Coordinator), Professor Anita Jones (UVA)

Mojo Vision, Tectus Corp., Saratoga, CA   *Sep 2022 – Nov 2022*
Graduate Research Intern, **Mentor**: Dr. Michael Grace

IBM Research, Yorktown Heights, NY   *May 2022 – Aug 2022*
Graduate Research Intern, **Mentor:** Dr. Kapil Singh

Graduate Research Assistant   *Jan 2018 – Jun 2024*
Secure Platforms Lab (SPL), Department of Computer Science, William & Mary
Mentor and Advisor: Dr. Adwait Nadkarni

Lead Graduate Student   *Jun 2022 – Jun 2024*
Secure Platforms Lab (SPL), Department of Computer Science, William & Mary

TEACHING EXPERIENCE

1. Instructor, **CIS 4930 Secure IoT,** University of South Florida – Fall 2024
2. Guest Lecturer, **CSCI 667 Concepts of Computer Security**, William & Mary – Spring 2022
   o Topic: "*Practical Integrity in the Smart Home"*
3. Guest Lecturer, **CSCI 445 Mobile Application Security**, William & Mary – Fall 2021
   o Topic: "*Ramifications of SSL Issues in Mobile Apps for the Smart Home"*
4. Guest Lecturer, **CSCI 680 IoT Security and Safety**, William & Mary – Spring 2021
   o Topic: "*Securing a Smart Home*"
5. Teaching Assistant, William & Mary, Aug 2017 – May 2019
   o **CSCI 141 Computational Problem Solving** – Taught labs and graded assignments
   o **CSCI 140 Programming for Data Science** – Taught labs and graded assignments
   o **CSCI 520 Mobile App Security** – Graded assignments
   o **CSCI 520 Mobile App Security** – Graded assignments

PUBLICATIONS

Conference Papers

[1] **Kaushal Kafle**, Prianka Mandal, Kapil Singh, Benjamin Andow, and Adwait Nadkarni, "Understanding the Privacy Practices of Political Campaigns: A Perspective from the 2020 US Election Websites", In *Proceedings of the 45th IEEE Symposium on Security and Privacy (IEEE S&P)*, CA, USA, 2024. [Source Code] [Pre-print]

[2] **Kaushal Kafle,** Kirti Jagtap, Mansoor Ahmed-Rengers, Trent Jaeger, Adwait Nadkarni, "Practical Integrity Validation in the Smart Home with HomeEndorser", In *Proceedings of the 17th ACM Conference on Security and Privacy in Wireless and Mobile Networks (WiSec),* Seoul, Korea, 2024. [PDF]

[3] Xin Jin*, Sunil Manandhar*, **Kaushal Kafle**, Zhiqiang Lin, and Adwait Nadkarni. "Understanding IoT Security from a Market-Scale Perspective*".* In *Proceedings of the 29th ACM Conference on Computer and Communications Security (CCS)*, Los Angeles, CA, USA, Nov 2022. *Co-first Authors. [Source Code] [PDF]

[4] Sunil Manandhar, **Kaushal Kafle**, Benjamin Andow, Kapil Singh, and Adwait Nadkarni, "Smart Home Privacy Policies Demystified: A Study of Availability, Content, and Coverage". In *Proceedings of the 31st USENIX Security Symposium (USENIX)*, Boston, MA, USA, 2022. [Data] [PDF]

[5] Amit Seal Ami, Nathan Cooper, **Kaushal Kafle**, Kevin Moran, Denys Poshyvanyk, and Adwait Nadkarni, "Why Crypto-detectors Fail: A Systematic Evaluation of Cryptographic Misuse Detection Techniques," in *Proceedings of the 43rd IEEE Symposium on Security and Privacy (IEEE S&P)*, 2022. [Source Code] [PDF]

[6] Sunil Manandhar, Kevin Moran, **Kaushal Kafle**, Ruhao Tang, Denys Poshyvanyk, and Adwait Nadkarni. "Towards a Natural Perspective of Smart Homes for Practical Security and Safety Analyses." In *Proceedings of the 41st IEEE Symposium on Security and Privacy (S&P)*, San Francisco, CA, USA, May 2020. [PDF]

[7] **Kaushal Kafle**, Kevin Moran, Sunil Manandhar, Adwait Nadkarni, and Denys Poshyvanyk. "A Study of Data Store-based Home Automation." In *Proceedings of the 9th ACM Conference on Data and Application Security and Privacy (CODASPY)*. Dallas, TX, USA, March 2019. ***Best Paper Award*** 🏆 [PDF] [press coverage]

[8] Richard Bonett, **Kaushal Kafle**, Kevin Moran, Adwait Nadkarni, and Denys Poshyvanyk. "Discovering Flaws in Security-Focused Static Analysis Tools for Android using Systematic Mutation." In *Proceedings of the 27th USENIX Security Symposium. Baltimore*, MD, USA, Aug 2018. [Source code] [PDF]

Journal Papers

[9] Amit Seal Ami, **Kaushal Kafle**, Kevin Moran, Adwait Nadkarni, and Denys Poshyvanyk. "Systematic Mutation-based Evaluation of the Soundness of Security-focused Android Static Analysis Techniques". In *ACM Transactions on Security & Privacy (TOPS),* 2021. [PDF]

[10] **Kaushal Kafle**, Kevin Moran, Sunil Manandhar, Adwait Nadkarni, and Denys Poshyvanyk. "Security in Centralized Data Store-based Home Automation Platforms- A Systematic Analysis of Nest and Hue." In *ACM Transactions on Cyber-Physical Systems (TCPS)*, 2020. [PDF]

Tool Demo Papers

[11] Prianka Mandal, Sunil Manandhar, **Kaushal Kafle**, Kevin Moran, Denys Poshyvanyk, and Adwait Nadkarni. "*Helion: Enabling Natural Testing of Smart Homes".* In *Proceedings of the ACM Joint European Software Engineering Conference and Symposium on the Foundations of Software Engineering (ESEC/FSE), Demonstration Track*, Dec 2023. [Source Code] [PDF]

[12] Amit Seal Ami, Syed Yusuf Ahmed, Radowan Mahmud Redoy, Nathan Cooper, **Kaushal Kafle**, Kevin Moran, Denys Poshyvanyk, and Adwait Nadkarni. "MASC: A Tool for Mutation-based Evaluation of Static Crypto-API Misuse Detectors". In *Proceedings of the ACM Joint European Software Engineering Conference and Symposium on the Foundations of Software Engineering (ESEC/FSE), Demonstration Track*, Dec 2023. [Source Code] [PDF]

[13]   Amit Seal Ami, **Kaushal Kafle**, Kevin Moran, Adwait Nadkarni, and Denys Poshyvanyk. "Demo: Mutation-based Evaluation of Security-focused Static Analysis Tools for Android." In *Proceedings of the 43rd IEEE/ACM International Conference on Software Engineering (ICSE'21), Formal Tool Demonstration,* May 2021, [Source Code] [PDF]

Posters

[14]   "Understanding the Privacy Practices of Political Campaigns"*, at the Network and Distributed System Security (NDSS) Symposium'24*, San Diego, CA – Feb 2024 [PDF]

[15]   "Security and Privacy in the Smart Home Ecosystem"*, at the Annual Virginia Academy of Science, Engineering and Medicine (VASEM) Summit*, Richmond, VA – Oct 2023 [PDF]

[16]   "Expanding Computer Science Learning Opportunities in K-12 Instruction in Virginia Schools"*, at the Annual Virginia Academy of Science, Engineering and Medicine (VASEM) Summit*, Richmond, VA – Oct 2023 [PDF]

[17]   "Understanding the Privacy Practices of Political Campaigns"*, at the CCI Symposium'23*, Richmond, VA – April 2023 – ***Best Poster Award*** 🏆 [PDF]

[18]   "Smart Home Privacy Demystified"*, at the CCI Symposium 2022*, Richmond, VA – April 2022 [PDF]

[19]   "A Study of Data Store-based Home Automation"*, at ACM CODASPY'19* **,** Dallas, TX – March 2019 [PDF]

CONFERENCE PRESENTATIONS, INVITED TALKS AND MEDIA OUTREACH

Conference Presentations

1. "*Helion: Enabling Natural Testing of Smart Homes*" at the **Foundations of Software Engineering (FSE'23)**, **Demonstrations Track,** San Francisco, CA – December 2023
2. "*A Study of Data-store Based Home Automation*" at the **9th ACM CODASPY**, Dallas, TX – March 2019
3. "*A Study of Data-store Based Home Automation*" at the **18th Graduate Research Symposium**, William & Mary, Williamsburg – March 2019
4. "*Discovering Flaws in Security-Focused Static Analysis Tools for Android using Systematic Mutation*" at the **27th USENIX Security Symposium**, Baltimore – August 2018

Invited Talks and Outreach

5. *"Personal data and the privacy gaps of political campaigns"* – invited to discuss the findings of my research in ***On the Ballot* podcast by Ballotpedia** (Episode Link) – June 2024
6. *"Guest Post: A PhD Student's Experience at the LiSPI Workshop",* **Leadership in Science Policy Institute (LiSPI) workshop**, invited by *Computing Research Association (CRA)*, Washington DC – Nov 2023 [Link]
7. "*Understanding the Security of Smart Home Platforms*", as part of the **Emerging Scholar Series**, Public Scholarship Initiative, Williamsburg Regional Library – March 2022
8. *"How hackable is your home?",* invited as an expert on smart home security in ***Which? Investigates* podcast** (Episode Link) – October 2021
9. "*The Security of Smart Home Platforms*", Research talk at the **Journal Club**, William & Mary, Williamsburg – September 2019
10. "*Enabling Safe and Secure Home Automation: Problems, Best Practices and Future Opportunities"*, William & Mary Developer Outreach to Williamsburg Developers Group, Williamsburg, VA, July 2019
11. *Outreach to High School Students*, invited by **Advanced Technology Center**, V. Beach, VA – April 2019
12. "*Hacking Your Smart Home*" podcast, invited to discuss my work on smart home security by **News Radio WINA** (Link) – December 2018

AWARDS & HONORS

1. Participant in the ***Science Policy & Advocacy for Research Competition (SPARC) series***, *Universities Research Association (URA)*, 2024

2. ***Commonwealth of Virginia Engineering & Science (COVES) Policy Fellow,*** Selected by *Virginia Academy of Science, Engineering and Medicine (VASEM)*, Host office - *Virginia Department of Education*, 2023
3. ***Best Poster Award,*** CCI Symposium 2023, Richmond, VA, USA – April 2023
4. ***Best Paper Award***, ACM CODASPY, Dallas, TX, USA - March 2019
5. ***Graduate Studies Advisory Board (GSAB) Research Grant,*** William & Mary - Fall 2021
6. ***International Student Opportunity Award,*** William & Mary - Spring 2020, Spring 2021
7. ***Travel Award*** – IEEE S&P (2024), WiSec (2024), NDSS (2024), Computing Research Association (2023), USENIX Security Symposium (2018)

PROFESSIONAL SERVICE

1. **Poster Session Chair -** NDSS 2025
2. **Conference Program Committee Member**
   a. *NDSS* Program Committee - 2024
   b. *USENIX Security Symposium (USENIX)* Artifact Evaluation Committee - 2021, 2022, 2023
   c. *ACSAC* Artifact Evaluation Committee – 2023
   d. *IEEE/ACM Workshop on Internet of Safe Things (SafeThings)* Program Committee - 2024
3. **Journal Reviewer**
   a. *Transactions on Privacy and Security (TOPS)* – Jul 2024, Aug 2024
   b. *Computing Survey (CSUR)* – May 2024
4. **Conference External Reviewer**
   a. *Top-tier conferences -* NDSS (2020, 2021, 2022, 2024), USENIX (2019, 2021)
   b. *Other conferences -* ACSAC (2022, 2023), ICISS (2019, 2022, 2023), ACNS (2024), CNS (2022)
5. **2024 COVES Fellow Selection Committee**, Virginia Academy of Science, Engineering and Medicine (VASEM) - 2024