Kaushal Kafle

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I am a PhD student in the Department of Computer Science at the College of William and Mary, being advised by [Dr. Adwait Nadkarni](http://adwaitnadkarni.com/). My research interests lie in analyzing the security and privacy practices of modern operating systems as well as designing practical security frameworks for such systems. I work at the [Secure Platforms Lab (SPL)](https://spl-wm.github.io/) at William & Mary. My work on the security analysis of smart home platforms has been featured in [multiple news outlets](https://kaushalkafle.com/publications#press)!

**EDUCATION**

**College of William and Mary PhD in Computer Science August 2017 - Present**

***Advisor***: Dr. Adwait Nadkarni

**Pulchowk Campus, Tribhuvan University Bachelor’s in Computer Engineering Nov 2011- Nov 2015**

**PUBLICATIONS**

**Conference Papers (Partial)**

**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]](https://kaushalkafle.com/assets/pdf/kafle-codaspy19.pdf) [[press coverage]](https://kaushalkafle.com/publications#press) ****

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. [[Link](https://kaushalkafle.com/assets/pdf/manandhar-sec22.pdf)]

Xin Jin, Sunil Manandhar, **Kaushal Kafle**, Zhiqiang Lin, and Adwait Nadkarni. "Understanding IoT Security from a Market-Scale Perspective." In *Proceedings of the 2022 ACM SIGSAC Conference on Computer and Communications Security(CCS)*, Los Angeles, CA, USA, 2022. [[Link](https://kaushalkafle.com/assets/pdf/manandhar-ccs22.pdf)]

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 *IEEE Symposium on Security and Privacy (IEEE S&P)*, 2022. [[Link]](https://kaushalkafle.com/assets/pdf/ami-oakland22.pdf)

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, August 2018. [[Source code]](https://muse-security-evaluation.github.io/) [[PDF]](https://kaushalkafle.com/assets/pdf/bonett-sec18.pdf)

**Journal Papers**

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*](https://dl.acm.org/journal/tops)*),* 2021. [[Link]](https://doi.org/10.1145/3439802)

**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. [[Link]](https://doi.org/10.1145/3418286)

**WORK EXPERIENCE**

**Graduate Research Intern, Mojo Vision, Tectus Corp.** *Sep 2022 – Nov 2022*

* Understanding the security and privacy implications of AR Contact Lens
* Designing a new security framework for AR Contact Lens

**Graduate Research Intern, IBM Research** *May 2022 – Aug 2022*

* Mapping the behavior of software code to data policies

**Research Assistant, Department of Computer Science, William & Mary** *Jan 2018 – Present*

***Ongoing Research Projects (partial)***

* **Policy to Behavior tracking in software code (Project Lead)**
  + *Ongoing*
* **Understanding Privacy in Politics (Project Lead)**
  + *Under submission*

***Completed Research Projects (partial)****:*

* **Security of Data-Store Based Home Automation (*Project Lead)*:**
  + Won the **Best Paper Award** in *ACM CODASPY ’19*
  + A journal extension was accepted to *ACM TCPS’20*.
  + [Press coverage](https://kaushalkafle.com/publications#press)
* **MASC (Mutation-based Analysis of Static Crypto-misuse detection techniques):**
  + *IEEE S&P ’22*
* **MUSE (MUtation-based Soundness Evaluation)**:
  + *USENIX ‘18*
  + A journal extension was accepted to *ACM TOPS’21*.

**Teaching Assistant, Department of Computer Science, William & Mary** *Aug 2017 – May 2019*

*Taught labs and graded assignments for the following classes:*

* Computational Problem Solving (CSCI 141), Fall 2017 – *133 Students*
* Programming for Data Science (CSCI 140), Spring 2019 – *93 Students*

*Graded assignments for the following classes:*

* Mobile App Security (CSCI 520), Spring 2018 – *20 Students*
* Mobile App Security (CSCI 520), Fall 2018 – *12 Students*

**CONFERENCE PRESENTATIONS & INVITED TALKS**

* **Guest Lecture in Concepts of Computer Security (CSCI 667)** *Apr 28th, 2022*
  + “Towards Practical Integrity in the Smart Home”
  + William & Mary, Williamsburg, VA
* **Emerging Scholar Series**, Public Scholarship Initiative Mar 3rd, 2022
  + “Understanding the Security of Smart Home Platforms”
  + Hosted by Williamsburg Regional Library
* **Guest Lecture in Mobile Application Security (CSCI 445)** *Oct 7th, 2021*
  + Ramifications of SSL issues in mobile apps for the smart home
  + William & Mary**,** Williamsburg, VA
* **Guest Lecture in IoT Security and Safety (CSCI 680)** *Feb 7th, 2021*
  + **“**Securing a Smart home**”**
  + William & Mary**,** Williamsburg, VA
* **Journal Club** - William & Mary, Williamsburg, VA *Sep 26th, 2019*
  + “The Security of Smart Home Platforms”
* **9th ACM CODASPY** – Dallas, TX *Mar 25th, 2019*
  + “A Study of Data-store Based Home Automation”
* **18th Graduate Research Symposium ­**– William & Mary, Williamsburg, VA *Mar 15th, 2019*
  + “A Study of Data-store Based Home Automation”
* **USENIX’18** – Baltimore, MD *Aug 17th, 2018*
  + “Discovering Flaws in Security-Focused Static Analysis Tools for Android using Systematic Mutation”

**AWARDS & HONORS**

* **GSAB Research Grant,** William & Mary - Fall 2021
* **International Student Opportunity Award,** William & Mary - Spring 2020, Spring 2021
* **Best Paper Award**, ACM CODASPY, Dallas, TX, USA - March 2019
* **USENIX Security Symposium** **Travel Award** - 2018

**PROFESSIONAL SERVICE**

* **Reviewer for Conferences**
  + USENIX Artifact Evaluation Committee 2021, 2022
* **Sub-reviewer for Conferences**
  + NDSS - 2020, 2021, 2022
  + Annual Computer Security Applications Conference (ACSAC) - 2022
  + USENIX Security Symposium (USENIX) - 2019, 2021
  + The International Conference on Information Systems Security (ICISS) - 2019

**OTHER ACTIVITIES**

* Invited to participate in *Which? Investigates* podcast on smart home security ([Link](https://play.acast.com/s/which-investigates/howhackableisyourhome-)), Oct 2021
* My work featured in various news outlets ([Links here](https://kaushalkafle.com/publications#press))
* One of the founding members of Secure Platforms Lab at William & Mary ([Lab website](https://spl-wm.github.io/))
* Volunteer, IOE Graduate Conference, Pulchowk, Lalitpur, Nepal 2015
* Volunteer, Latex Workshop at IOE Graduate Conference, Pulchowk, Lalitpur, Nepal 2015
* Organizer, Hackathon, Locus 2015
* Organizer, Yomari Codecamp, Locus 2015

**REFERENCES**

* *Dr. Adwait Nadkarni (PhD Advisor)*  
  Assistant Professor, Department of Computer Science  
  College of William and Mary, VA, USA  
  Contact: [apnadkarni@wm.edu](mailto:apnadkarni@wm.edu)
* *Dr. Trent Jaeger (Collaborator)*  
  Professor, Department of Computer Science  
  Pennsylvania State University, PA, USA  
  Contact: [trj1@psu.edu](mailto:trj1@psu.edu)
* *Dr. Kapil Singh (Mentor at IBM Research)*  
  Principal Research Staff Member  
  IBM Research  
  Contact: [kapil@us.ibm.com](mailto:kapil@us.ibm.com)