

# Sunil Manandhar

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## RESEARCH

I am a Ph.D. candidate in the Department of Computer Science at William & Mary currently being advised by [Dr. Adwait Nadkarni](#). My research focuses on the analysis and enforcement of security, safety, and privacy policies in modern operating systems. I am currently building and maintaining frameworks for smart home security and privacy policy analysis.

## EDUCATION

**Ph.D. in Computer Science**, GPA 3.85 - **The College of William and Mary**, Williamsburg, VA *Aug 2016 - Present*  
Advisor: [Dr. Adwait Nadkarni](#)

*Relevant Coursework:* Advanced System Security Engineering, Advanced Topics in System and Security, CyberSecurity Research Analysis, Computer & Network Security, Advanced Software Engineering, Ubiquitous and Mobile Computing, Analysis of Algorithms, Intro to Machine Learning

**BS in Computer Science and IT**, GPA: 79.5% - **Tribhuvan University**, Kathmandu, Nepal *Nov 2011 - Nov 2015*

## PUBLICATIONS

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. *ACM Transactions on Cyber Physical Systems, special issue on Security and Privacy for Connected CPS (TCPS)* [[PDF](#)]

**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. *To Appear in the Proceedings of the 41st IEEE Symposium on Security and Privacy (S&P)*, San Francisco, CA, USA, May 2020. [[PDF](#)]

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**. [[Press Coverage](#)] [[PDF](#)]

Sigmund Albert Gorski III, Ben Andow, Adwait Nadkarni, **Sunil Manandhar**, William Enck, Eric Bodden, and Alexandre Bartel. ACMiner: Extraction and Analysis of Authorization Checks in Android's Middleware. *In Proceedings of the 9th ACM Conference on Data and Application Security and Privacy (CODASPY)*, Dallas, TX, USA, March 2019. [[CVE-2019-9351](#), [CVE-2019-9377](#), [CVE-2019-9438](#)] [[PDF](#)]

## WORK EXPERIENCE

**COVES Fellow, Center for Innovative Technology** *May 17 2021 -*  
❑ Model statewide privacy policies for smart community Testbed

**Co-op, IBM** *Sep 2020 - Dec 2020*  
❑ Framework for privacy policy analysis and compliance (ongoing)

- ❑ Created pipeline for NLP tasks
- ❑ Trained Named-Entity-Recognition (NER) Model
- ❑ Multi Label Classification using BERT

**Research Intern, IBM** *Jun 2020 - Sep 2020*  
❑ Framework for Privacy Policy analysis

**Lead Grad Student, SPL Lab** *Jan 2020 - Present*  
❑ Conducted weekly student-run meetings and organized events to improve research skills  
❑ Managed lab website and logistics [[Website](#)]

- ❑ Mentored 4 students in research projects

#### **Research Assistant, CS Department, William & Mary**

*May 2018 - Present*

- ❑ Analyzed Privacy Policies to develop insights into data protection practices (ongoing)
- ❑ Designed framework for generating natural home automation scenarios to improve security and safety in smart homes
- ❑ Developed proof of concept exploits for vulnerabilities in access control enforcement of APIs in the Android Platform

#### **Teaching Assistant, William & Mary**

*Aug 2016 - May 2017*

- ❑ Computational Problem Solving

#### **Technology Lead, Universal Language Learning, China**

*Dec 2016 - Present*

- ❑ Built a chatbot engine for kids to help with language learning. <https://my-little-harper.myshopify.com/>

#### **Mobile App Developer, Moondrop, San Francisco**

*Jan 2016 - Aug 2016*

- ❑ Managed Mobile Application and Updated the App with Material Design <https://tinyurl.com/y65eafd6>

#### **Software Engineer, Bajra Technologies, Kathmandu, Nepal**

*Jan 2015 - Jan 2016*

- ❑ SiteHawk - Crawler, and Interface for Website Site Deface Detection <https://tinyurl.com/y4ro377>
- ❑ Imperial - Cordova based Mobile App for Side-Kick Plus Device <https://tinyurl.com/y6dz3qjg>

#### **Business Associate, Axon System, Kathmandu, Nepal**

*May 2014 - Dec 2014*

- ❑ MyFarm - Mobile Application
- ❑ Driving License Mobile App <https://tinyurl.com/s6rjgmo>

### **AWARDS AND HONORS**

- ❑ The Commonwealth of Virginia Engineering & Science (COVES) Fellow, 2021
- ❑ S. Laurie Sanderson Award for Excellence in Undergraduate Mentoring Award, 2021
- ❑ Distinguished Reviewer - Shadow PC, IEEE S&P 2021
- ❑ Best Paper Award at CODASPY, Dallas, TX, USA, March 2019
- ❑ Received 3 CVEs and mentions on the Android Security Bulletin
- ❑ Winner of Imagine Cup Nepal 2014
- ❑ Winner of Skype Challenge in Imagine Cup 2014
- ❑ President of Computer Science and Information Technology Association of Nepal (2014)
- ❑ Microsoft Student Partner - St. Xavier's College (2014)

### **PRESENTATIONS AND INVITED TALKS**

- ❑ “Towards a Natural Perspective of Smart Homes for Practical Security and Safety Analyses”
  - ❑ 41st IEEE Symposium on Security and Privacy
  - ❑ IBM
  - ❑ Journal Club, William & Mary
- ❑ “Outlier Detection in Large Scale Dataset”
  - ❑ 17th Annual Graduate Research Symposium

### **PROFESSIONAL SERVICE**

- ❑ **Shadow PC for IEEE S&P 2021**
- ❑ **Sub-reviewer for Conferences**
  - ❑ USENIX 2021
  - ❑ USENIX Safethings 2021
  - ❑ ISOC Network and Distributed System Security Symposium (NDSS), 2020
  - ❑ USENIX Security Symposium (USENIX), 2019
  - ❑ The International Conference on Information Systems Security (ICISS), 2019

- ❑ **Student Technology Advisory Committee ( Arts and Science Department - William & Mary) (2020)**