

Dr. Ed Novak

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Professional Experience

Assistant Professor of Computer Science - Franklin and Marshall College, 2016 - present.

Freelance Web Developer 2010 - present.

Graduate Student Researcher and Teaching Assistant - The College of William and Mary, 2010 - 2016.

Education

Ph.D. Computer Science, mentored by Dr. Qun Li, at the College of William and Mary, August of 2016.

M.S. Computer Science, College of William and Mary, May of 2012.

B.A. Computer Science and Math (*double major*), Monmouth College, May of 2010.

Research Interests

My research is focused on mobile device security and privacy. I have been striving to provide practical, secure, and private solutions for mobile devices at the intersection of the new Internet of Things (IoT). Recently I've been working on problems such as information leakage, and smali byte-code modification of Android applications to improve privacy. My research interests include mobile devices, ubiquitous computing, security and privacy, networking, and systems.

As a full time assistant professor at Franklin and Marshall College, I have been working to establish my own research program that produces distinguished, high quality, novel research. My background was formed at the College of William and Mary where I studied as a Ph.D. candidate under Dr. Qun Li in the area of ubiquitous computing, mobile devices, security and privacy.

Publications

Ed Novak, Shaamyl Anwar, Saad Mahboob **Smali Byte-Code Instrumentation for Dynamic Information Flow Tracking Demystified**. Under submission...

F&M publication w/student collaborator

Daniel Graham *Ethical Hacking*. No Starch Press, 2021. 376pp. Tech. Editor: Ed Novak. ISBN: 978-1-71-850187-4, Available At: <https://nostarch.com/ethical-hacking>

Dai Hou, Hao Han, Ed Novak **TAES: Two-factor Authentication with End-to-End Security against VoIP Phishing**. In the 2020 IEEE/ACM Symposium on Edge Computing (SEC) "HotWoT" workshop.

Ian Walk, Arnold Yim, Ed Novak, Charles Reiss, Daniel Graham **Redesigning the Online Video Lecture Player to Promote Active Learning**. In the Frontiers In Education (FIE) Conference, 2020.

Ed Novak, Phyo Thuta Aung, Thu do **VPN+ Towards Detection and Remediation of Information Leakage on Smartphones**. In the 21st IEEE International Conference on Mobile Data Management (MDM) 2020.

F&M publication w/student collaborators

Ed Novak, Chris Marchini **Android App Update Timing: A Measurement Study**. In the 2019 International Workshop on Mobile Ubiquitous Systems and Technologies (in conjunction with IEEE MDM 2019).

F&M publication w/student collaborator

Ed Novak, Zhuofan Tang, Qun Li **Ultrasound Proximity Networking on Smart Mobile Devices for IoT Applications**. In the IEEE Internet of Things Journal 2018.

F&M publication w/student collaborator

Yafeng Yin, Qun Li, Lei Xie, Shanhe Yi, Ed Novak, Sanglu Lu **CamK: Camera-based Keystroke Detection and Localization for Small Mobile Devices**. In the IEEE Transactions on Mobile Computing, Apr 2013.

Zijian Hao, Ed Novak, Shanhe Yi, Qun Li **Challenges and Software Architecture for Fog Computing**. In the IEEE Internet Computing Magazine, March 2017.

Cheng Li, Zhengrui Qin, Ed Novak, Qun Li **Securing SDN Infrastructure of IoT-Fog Networks From MitM Attacks**. In the IEEE Internet of Things Journal, May 2017.

Kyle Wallace, Kevin Moran, Ed Novak, Gang Zhou, Kun Sun **Toward Sensor-Based Random Number Generation for Mobile and IoT Devices**. In the IEEE Internet of Things Journal, May 2016.

Zhengrui Qin, Yutao Tang, Ed Novak, Qun Li **MobiPlay: A Remote Execution Based Record-and-Replay Tool for Mobile Applications**. In the Proceedings of IEEE/ACM ICSE, 2016. (*Acceptance rate: 19%*)

Shanhe Yi, Zhengrui Qin, Ed Novak, Yafeng Yin, Qun Li **GlassGesture: Exploring Head Gesture Interface of Smart Glasses**. In the Proceedings of IEEE INFOCOM, 2016. (*Acceptance rate: 18%*)

Yafeng Yin, Qun Li, Lei Xie, Shanhe Yi, Ed Novak, Sanglu Lu **CamK: A Camera-based Keyboard for Small Mobile Devices**. In the Proceedings of IEEE INFOCOM, 2016. (*Acceptance rate: 18%*)

Hao Han, Shanhe Yi, Qun Li, Shen Guobin, Yunxin Liu, Ed Novak **AMIL: Localizing Neighboring**

Mobile Devices Through Simple Gesture. In the Proceedings of IEEE INFOCOM, 2016. (*Acceptance rate: 18%*)

Daniel Graham, Gang Zhou, Ed Novak, Jeffery Buffkin **A Smartphone Compatible SONAR Ranging Attachment for 2D Mapping.** In the IEEE Internet of Things Journal, vol. 2, no. 6, 2015.

Nancy Carter, Ed Novak, Cheng Li, Zhengrui Qin, Qun Li **Graphical Passwords for Older Computer Users.** In the Adjunct Proceedings of ACM UIST (Poster), 2015. Pages 29–32.

Ed Novak, Yutao Tang, Zijiang Hao, Yifan Zhang, Qun Li **Physical Media Covert Channels on Smart Mobile Devices** In the Proceedings of ACM UBICOMP 2015. Pages 367–378. (*Acceptance rate: 23%*) Won “Honorable Mention for Best Paper” Award at UbiComp (*Award acceptance rate: 5%*).

Zijiang Hao, Yutao Tang, Yifan Zhang, Ed Novak, Nancy Carter Qun Li **SMOC: A Secure Mobile Cloud Computing Platform** In the Proceedings of IEEE INFOCOM, 2015. Pages 2668–2676. (*Acceptance rate: 19%*)

Ed Novak, Qun Li **Near-Pri: Private, Proximity Based Location Sharing** In the Proceedings of IEEE INFOCOM, 2014. Pages 37–45. (*Acceptance rate: 19%*)

Xiaojun Zhu, Fengyuan Xu, Ed Novak, Chiu C. Tan, Qun Li, Guihai Chen **Extracting Secret Key from Wireless Link Dynamics in Vehicular Environments** In the Proceedings of IEEE INFOCOM, 2013. Pages 2283–2291. (*Acceptance rate: 17%*)

Ed Novak, Qun Li **Security and Privacy in Online Social Networks** - Technical Report: WM-CS-2012-2, May of 2012. (*The culmination of my M.S. project*)

Scholarly Review Work

3+ reviews for the “IEEE Internet of Things Journal”
<https://iee-iotj.org/>

3+ reviews for MDPI “Sensors” journal
<https://www.mdpi.com/journal/sensors>

2+ reviews for MDPI “Electronics” journal
<https://www.mdpi.com/journal/electronics>

Technical Program Committee Member for SpaCCS 2020
<http://www.spaccs2020.com/>

5+ reviews for the “ACM Transactions on Sensor Networks” TOSN
<https://dl.acm.org/journal/tosn>

Teaching Experience

	CPS-111 CS1	CPS-112 CS2	CPS-222 CS3	CPS-242 CO	CPS-261 Algorithms	CPS-370 OS	CPS-379/340 MAD
2021 Mod 4 2021 Mod 3	1			1			1
2021 J-Term			1				
2020 Mod 2 2020 Mod 1			1				
2020 Summer		1 + 1 Lab					
2020 Spring	<i>Pandmic and Junior Faculty Research Semester</i>						
2019 Fall		1 + 1 Lab				1	
2019 Spring 2018 Fall		1 1 + 1 Lab			1		1
2018 Spring 2017 Fall	1 + 1 Lab			2		1	
2017 Spring 2016 Fall	1 Lab 1 + 2 Labs			1			1

Table 1: Courses Taught. Values represent the number of sections of the course.

	Hackman Research Student	CPS-470	CPS-490	CPS-390	IFC-399
		Senior Capstone	Ind. Study	SGDR	IFC
2021 Summer 2021 Spring 2020 Fall	1 (S. Mahboob)		1		2
2020 Summer	1 (M. Anwar)				
2020 Spring	<i>Pandmic and Junior Faculty Research Semester</i>				
2019 Fall			1		
2019 Summer 2019 Spring 2018 Fall	1 (P. Aung)			5	2
2018 Summer 2018 Spring 2017 Fall	1 (C. Marchini)	1	2		
2017 Summer 2017 Spring 2016 Fall	1 (Z. Tang)				2

Table 2: Special Courses Taught. Values represent the number of students involved.

Listing of All Courses Taught

2021 Spring

- CPS 340 - Mobile Application Development - Upper level CS elective. *mod4*

- CPS 242 - Computer Organization - Core course for CS majors. *mod4*
- CPS 111 - Introduction to Computational Thinking - Introductory CPS course. *mod3*

2020 Fall

- CPS 222 - Computer Science III - Final Course in Introductory Sequence *j-term*
- CPS 222 - Computer Science III - Final Course in Introductory Sequence *taught as an independent study for one student in mod2*
- CPS 222 - Computer Science III - Final Course in Introductory Sequence *mod1*

2020 Summer

- CPS 112 - Computational Thinking with Data Structures and Algorithms. - Introductory CPS Course *su20*
1 lecture section + 1 lab section

2019-2020 School Year

JFRS/Sabbatical in Spring 2020 (*pandemic*)

- CPS 112 - Computational Thinking with Data Structures and Algorithms. - Introductory CPS Course *fa19*
1 lecture section + 1 lab section
- CPS 370 - Operating Systems - Upper level CS elective. *fa19*
- CPS 490 - Independent Study on Privacy and Information Leakage in Android Devices. *fa19*

2018-2019 School Year

- CPS 391 - Small Group Direct Study on Dynamic Information Flow Tracking *sp19*
- CPS 379 - Mobile Application Development - New CS elective of my own design. *sp19*
- CPS 112 - Computational Thinking with Data Structures and Algorithms. - Introductory CPS Course *fa18*
1 lecture section + 1 lab section

- CPS 261 - Algorithms - Core course for CS majors. *fa18*
- CPS 112 - Computational Thinking with Data Structures and Algorithms. - Introductory CPS Course *fa18*

2017-2018 School Year

- CPS 111 - Introduction to Computational Thinking - Introductory CPS course. *sp18*
1 lecture section + 1 lab section
- CPS 470 - Senior Capstone - Pilot course team-taught for graduating CS majors. *sp18*
CPS [-] 490 - Independent Study - With students Zhuofan Tang and Paul Kim *sp18*
- CPS 242 - Computer Organization - Core course for CS majors. *fa17*
2 lecture sections
- CPS 370 - Operating Systems - Upper level CS elective. *fa17*

2016-2017 School Year

- CPS 242 - Computer Organization *sp17*
- CPS 379 - Mobile Application Development - New CS elective of my own design. *sp17*
- CPS 111 - Introduction to Computational Thinking *sp17*
1 lab section
- CPS 111 - Introduction to Computational Thinking *fa16*
1 lecture section + 2 lab sections

Previous Teaching Experience

Fall 2015 : Teaching Assistant, CS 304 at W&M

Assisted Dr. Qun Li in teaching Computer Organization CS 304 / 504. Acted as guest lecturer throughout the semester and helped prepare online class materials.

Summer 2015 : Instructor FCPS, Johns Hopkins University

Worked for the JHU Center for Talented Youth summer program developing the curriculum for, and teaching, fundamentals of computer science (FCPS); a college level course for young, advanced placement students.

2013 - 2014 : Advised senior undergraduate Alessandro Roux

Worked closely together on a weekly basis and designing and implementing a system to support encrypted email in gMail, which was used as his honors project as an undergraduate computer science major.

2010 - 2013 : Lab Teaching Assistant, College of William and Mary

Taught four semesters of CS 141 Lab, the introductory computer science class. Acted as head T.A. for the final two. Held regular office hours and worked with students individually.

Self-initiated tutoring and advising of eight different undergraduate students on other projects and classes. Worked closely with students on a weekly basis.

Awards

S. Laurie Sanderson Award for Excellence in Undergraduate Mentoring

for my work with undergraduate Alessandro Roux in 2014.

Arts & Sciences OGSR/Graduate Student Association Conference Funds 2015, College of W&M.

Honorable Mention for Best Paper

at Ubicomp 2015.

Honorable Mention for Excellence in Scholarship in the Natural and Computational Sciences

at the W&M Graduate Research Symposium 2015.

Technical Skills

Experience:

Android application development, AOSP modification, full stack web development, Firefox webextensions, homomorphic encryption, oblivious transfer, private set intersection, physical layer networking, covert channels.

Tools:

Git, L^AT_EX, GIMP, Matplotlib, Matlab.

Programming Languages:

java, python, javascript, C, C++, matlab/octave, full stack web development (html, css, php, mySQL, ruby on rails), bash, assembly (smali, MIPS, RISC-V, X86).

Activities and Side Projects

Lifelong swimmer and water polo player. Co-Founder of Monmouth College Water Polo Club, 2007. Club president W&M water polo from 2012 - 2016. Faculty advisor for F&M water polo 2016 - present.

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