

Adam J. Aviv

CONTACT

INFORMATION

Adam J. Aviv
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Washington, DC 20052, USA

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RESEARCH

INTERESTS

Computer Security; Usable Security; Network Security; Applied Cryptography; Computer Science and Cybersecurity Education.

EDUCATION & PROFESSIONAL EXPERIENCE

The George Washing University, Washington, DC USA

Associate Professor of Computer Science
July 2019 - Present

United States Naval Academy, Annapolis, MD USA

Assistant Professor of Computer Science
August 2013 - July 2019

University of Maryland, Baltimore County, Baltimore, MD USA

Adjunct Assistant Professor of Information Systems
January 2018 - Present

- Ph.D. Student Advised: Flynn Wolf

Swarthmore College, Swarthmore, PA USA

Visiting Assistant Professor of Computer Science
September 2012 - August 2013

University of Pennsylvania, Philadelphia, PA USA

Ph.D., in Computer and Information Science
September 2007 - August 2012

- Advisors: Professors Jonathan M. Smith and Matt Blaze
- Area of Study: Computer, Network and Smartphone Security

M.S.E, Computer and Information Science
September 2007 - December 2009

AT&T Labs Research, Florham Park, NJ USA

Summer Intern 2011 and 2012

Columbia University, New York, NY USA

B.S., Computer Science
September 2003 - May 2007

- Advisor: Professor Angelos Keromytis

JOURNAL
PUBLICATIONS

(Peer Reviewed)

1. Giuxin Ye, Zhanyong Tang, Dingyi Fang, Xiaojiang Chen, Willy Wolff, Adam J. Aviv, and Zheng Wang. A Video-based Attack for Android Pattern Lock. *ACM Transactions on Privacy and Security (TOPS)*, 21.4 (2018): 19.
2. Flynn Wolf, Adam J. Aviv, Ravi Kuber, "It's all about the start" classifying eyes-free mobile authentication techniques, *Journal of Information Security and Applications*, Volume 41, August 2018, Pages 28-40.
3. Flynn Wolf, Ravi Kuber, and Adam J. Aviv. An empirical study examining the perceptions and behaviours of security-conscious users of mobile authentication. *Behaviour & Information Technology* (2018): 1-15.
4. John Sonchack and Adam J. Aviv. Exploring large scale security system reproducibility with the LESS simulator. *Journal of Computer Security* 24.5 (2016): 645-665.
5. John Sonchack, Adam J. Aviv, Jonathan M. Smith. Cross-domain collaboration for improved IDS rule set selection. *Journal of Information Security Applications (JISA)*. Vol 24 (2015): 25-40.
6. Adam J. Aviv, Micah Sherr, Matt Blaze, and Jonathan Smith. Privacy-Aware Message Exchanges for Humanets. *Computer Communications*. Vol. 48 (2014): 30-43.
7. Adam J. Aviv, Vin Mannino, Thanat Owlarn, Seth Shannin, Kevin Xu, and Boon Thau Loo. Experiences in teaching an educational user-level operating systems implementation project. *SIGOPS Oper. Syst. Rev.* 46, 2 (July 2012), 80-86.

MAGAZINE
ARTICLES

(Peer Reviewed)

1. Adam J. Aviv, Ravi Kuber, and Devon Budzitowski. Is Bigger Better When it Comes to Android Graphical Pattern Unlock? *IEEE Internet Computing*. Vol. 21(6): 46-51. Nov/Dec 2017.
2. Andrew West and Adam J. Aviv. Measuring Privacy Disclosures in URL Query Strings. *IEEE Internet Computing*. Vol. 18(6): 52-59. Nov/Dec 2014.

CONFERENCE
PUBLICATIONS

(Peer Reviewed)

1. Timothy J. Forman, Adam J. Aviv, and Daniel S. Roche. "Twice as Nice? A Preliminary Evaluation of Double Android Unlock Patterns." In *CHI Conference on Human Factors in Computing Systems Extended Abstracts (CHI'19 Extended Abstracts)*. April 2020.
2. HIRAK RAY, FLYNN WOLF, RAVI KUBER AND ADAM J. AVIV. "Woe is me: Examining Older Adults' Perceptions of Privacy." In *CHI Conference on Human Factors in Computing Systems Extended Abstracts (CHI'19 Extended Abstracts)*, May 2019.
3. Flynn Wolf, Adam J. Aviv, and Ravi Kuber. "Pretty Close to a Must-Have: Balancing Usability Desire and Security Concern in Biometric Adoption." To appear in the proceedings of the Conference on Human Factors in Computing Systems (CHI'19). April 2019.
4. Anrin Chakraborti, Adam J. Aviv, Seung Geol Choi, Travis Mayberry, Daniel S. Roche, Radu Sion. rORAM: Efficient Range ORAM with $O(\log^2 N)$ Locality. To appear in the proceedings of Symposium on the Network and Distributed Systems Security (NDSS'19). Feb 2019.
5. Adam J. Aviv, Flynn Wolf, and Ravi Kuber. Comparing Video Based Shoulder Surfing with Live Simulation. In the proceedings of the Annual Computer Security Applications Conference. (AC-SAC'18). Dec 2018.
6. John Sonchack, Oliver Michel, Adam J. Aviv, and Eric Keller. Scaling Hardware Accelerated Monitoring to Concurrent and Dynamic Queries With *Flow. In the proceedings of the Usenix Annual Technical Conference (ATC'18). Jul 2018.
7. Flynn Wolf, Ravi Kuber, Adam J. Aviv. How Do We Talk Ourselves Into These Things? Challenges with Adoption of Biometric Authentication for Expert and Non-Expert Users. In the proceedings of CHI Extended Abstracts (CHI'18 Extended Abstracts). Apr 2018.

8. John Sonchack, Adam J. Aviv, Eric Keller, and Jonathan M. Smith. TurboFlow: Information Rich Flow Record Generation on Commodity Switches. In the proceedings of the EuroSys Conference (EuroSys'18). April 2018. (**Best Student Paper**)
9. Adam J. Aviv, John T. Davin, Flynn Wolf, Ravi Kuber. Towards Baselines for Shoulder Surfing on Mobile Authentication. In the proceedings of the Annual Computer Security Applications Conference (ACSAC'17). Dec 2017.
10. Daniel S. Roche, Adam J. Aviv, Seung Geol Choi, and Travis Mayberry. Deterministic, Stash-Free Write-Only ORAM. In the proceedings of the Conference on Communication Security (CCS'17). Oct 2017.
11. John T. Davin, Adam J. Aviv, Flynn Wolf, Ravi Kuber. Baseline Measurements of Shoulder Surfing Analysis and Comparability for Smartphone Unlock Authentication. In the proceedings of the CHI Extended Abstracts (CHI-EA'17). June 2017:
12. Adam J. Aviv, Daniel S. Roche, Travis Mayberry. ObliviSync: Practical Oblivious File Back and Synchronization. Symposium on Network and Distributed System Security (NDSS'17). Feb 2017.
13. John Sonchack, Anurag Dubey, Adam J. Aviv, Jonathan M. Smith, Eric Keller: Timing-based reconnaissance and defense in software-defined networks. In the proceedings of the Annual Computer Security Applications Conference (ACSAC'16). Dec 2016.
14. Vaishali Narkhede, Karuna P. Joshi, Adam J. Aviv, Seung Geol Choi, Daniel S. Roche, Tim Finin. IEEE International Conference on Cloud Computing (CLOUD'16). July 2016.
15. Daniel S. Roche, Adam J. Aviv, and Seung Geol Choi. A Practical Oblivious Map Data Structure with Secure Deletion and History Independence. In the proceedings of the IEEE Security and Privacy Symposium (S&P'16). May 2016.
16. Abdullah Ali, Ravi Kuber, and Adam J. Aviv. Developing and Evaluating a Gestural and Tactile Mobile Interface to Support User Authentication. In the proceedings of the iConference (iConf'16). Mar 2016.
17. John Sonchack, Adam J. Aviv, Eric Keller, and Jonathan M. Smith. Enabling Practical Software Defined Network Security Applications with OFX. In the proceedings of the Network and Distributed Systems Security Symposium (NDSS'16). Feb 2016.
18. Adam J. Aviv, Devon Budzitowski, and Ravi Kuber. Is Bigger Better? Comparing User-Generated Passwords on 3x3 vs 4x4 Grid Sizes for Android's Pattern Unlock. In the proceedings of the Annual Computer Security Applications Conference (ACSAC'15). Dec 2015.
19. Adam J. Aviv and Dane Fichter. Understanding Visual Perceptions of Usability and Security of Android's Graphical Password Pattern. In the proceedings of the Annual Computer Security Applications Conference (ACSAC'14). Dec 2014.
20. John Sonchack and Adam J. Aviv. LESS is more: Host-Agent Based Simulator for Large-scale Evaluation of Security Systems On the Privacy Concerns. In the proceedings of the European Symposium on Research in Computer Security (ESORICS'14). September, 2014.
21. Adam J. Aviv, Ben Sapp, Matt Blaze, and Jonathan M. Smith. Practicality of Accelerometer Side-Channel on Smartphones. In the proceedings of the Annual Computer Security Applications Conference (ACSAC'12). Dec 2012.
22. Adam J. Aviv, Micah Sherr, Matt Blaze, and Jonathan Smith. Privacy-Aware Message Exchanges for Geographically Routed Human Movement Networks. In the proceedings of the European Symposium on Research in Computer Security (ESORICS'12). Sep 2012.
23. Andrew West, Adam J. Aviv, Jian Chang, and Insup Lee. Spam Mitigation using Spatio-Temporal Reputation from Blacklist History. In proceedings of the 26th Annual Computer Security Application conference (ACSAC'10). Dec 2010.
24. Adam J. Aviv, Michael E. Locasto, Shaya Potter, and Angelos D. Keromytis. SSARES: Secure Searchable Automated Remote Email Storage. In Proceedings of the 23rd Annual Computer Security Applications Conference (ACSAC'07), Dec 2007.

WORKSHOP
PUBLICATIONS

(Peered Reviewed)

1. Maximilian Gola, Jan Rimkus, Adam J. Aviv, and Markus Dürmuth. Work in Progress: On the In-Accuracy and Influence of Android Pattern Strength Meters. In the proceedings of the Workshop on Usable Security (USEC'19). Feb 2019.
2. Adam J. Aviv and Ravi Kuber. Towards Understanding Connections between Security/Privacy Attitudes and Unlock Authentication. In the proceedings of the Workshop on Usable Security (USEC'18). Feb 2018.
3. Flynn Wolf, Adam J. Aviv and Ravi Kuber. Work-In-Progress: Performance of Eyes-Free Mobile Authentication. In the proceedings of the Workshop on Usable Security (USEC'18). Feb 2018.
4. Adam J. Aviv, Markus Dürmuth, and Payas Gupta. Position Paper: Measuring the Impact of Alphabet and Culture on Graphical Passwords. In the proceedings of the Who Are You?! Adventures in Authentication Workshop. Jul 2016.
5. Flynn Wolf, Ravi Kuber, Adam J. Aviv. Preliminary Findings from an Exploratory Qualitative Study of Security-Conscious Users of Mobile Authentication. In the proceedings of the 2nd Workshop on Security Information Workers at SOUPS'16. Jul 2016.
6. John Sonchack, Adam J. Aviv, Eric Keller. Timing SDN Control Planes to Infer Network Configurations. In the proceedings of the SDN-NFV Security Workshop (SDN-NFV'16). Mar 2016.
7. Adam J. Aviv, Justin Maguire, and Jeanne Luning-Prak. Analyzing the Impact of Collection Methods and Demographics for Android's Pattern Unlock. In the proceedings of the Usable Security Workshop (USEC'16). Feb 2016.
8. Andrew G. West, Adam J. Aviv. On the Privacy Concerns of URL Query Strings. In the Workshop on Web 2.0 Security and Privacy. May 2014. (**Best Paper**)
9. John Sonchack, Adam J. Aviv, Jonathan M. Smith. Bridging the Data Gap: Data Related Challenges in Evaluating Large Scale Collaborative Security Systems. The 6th Workshop on Cyber Security Evaluation and Testing (CSET'13). Aug 2013.
10. Adam J. Aviv and Andreas Haeberlen. Challenges in Experimenting with Botnet Detection Systems. In proceedings of the 4th Workshop on Cyber Security Experimentation and Test (CSET'11). Aug 2011.
11. Adam J. Aviv, Micah Sherr, Matt Blaze, and Jonathan M. Smith. Evading Cellular Data Monitoring with Human Movement Networks. In proceedings of the 5th Usenix Workshop on Hot Topics in Security (HotSec'10). Aug 2010.
12. Adam J. Aviv, Katherine Gibson, Evan Mossop, Matt Blaze, Jonathan M. Smith. Smudge Attacks on Smartphone Touch Screens. In the proceedings of the 4th Usenix Workshop on Offensive Technologies (WOOT'10). Aug 2010.
13. Jason Reed, Adam J. Aviv, Daniel Wagner, Andreas Haeberlen, Benjamin Pierce, and Jonathan M. Smith. Differential Privacy for Collaborative Security, In the Proceeding of the Third European Workshop on System Security (EuroSec '10). Mar 2010.
14. Andrew G. West, Adam J. Aviv, Jian Chang, Vinayak S. Prabhu, Matt Blaze, Sampath Kannan, Insup Lee, Jonathan M. Smith, and Oleg Sokolsky. QuanTM: A Quantified Trust Management System. In the proceedings of the Second European Workshop on System Security (EuroSec'09). Mar 2009.
15. Maritza L. Johnson, Chaitanya Atreya, Adam J. Aviv, Steven M. Bellovin, and Gail E. Kaiser. RUST: A Retargetable Usability Testbed for Web Site Authentication Technologies. In the proceedings of USENIX Usability, Psychology, and Security (UPSEC'08). Apr 2008.
16. Adam Aviv, Pavol Cerný, Sandy Clark, Eric Cronin, Gaurav Shah, Micah Sherr, and Matt Blaze. Security Evaluation of ES&S Voting Machines and Election Management System. In the proceedings of USENIX Electronic Voting Technology Workshop (EVT'08), Jul 2008.

NON-REFEREED
PUBLICATIONS

1. Adam J. Aviv. Security Side Channels Enabled by Smartphone User Interaction. Ph.D. Thesis, University of Pennsylvania. October, 2012.
2. Adam J. Aviv, Guarav Shah, Matt Blaze. Steganographic Timing Channels. Technical Report MS-CIS-11-18. University of Pennsylvania. Posted December, 2011.
3. Patrick McDaniel, Matt Blaze, and Giovanni Vigna (Team Leads) et al. EVEREST: Evaluation and Validation of Election-Related Equipment, Standards and Testing. Part of the Ohio Secretary of State EVEREST Review of electronic voting machines. December 2007

POSTERS

1. Timothy J. Forman and Adam J. Aviv. *Is Two Better Than One? Extending Android Unlock Patterns to Utilize Multiple Patterns*. At the Symposium on Usable Privacy and Security. August 2019.
2. John Sonchack, Adam J. Aviv, Eric Keller, and Jonathan Smith. *TurboFlow. Accelerated Flow Record Generation on Commodity Switches*. At the Symposium of Network System Design and Implementation (NSDI'17). March 2017.
3. Flynn Wolf, Ravi Kuber, and Adam J. Aviv. *Towards Non-Observable Authentication for Mobile Devices*. At the Symposium on Usable Privacy and Security (SOUPS). 2016.
4. Susanne Heidt and Adam J. Aviv. *Refining Graphical Password Strength Meters*. At the Symposium on Usable Privacy and Security (SOUPS). 2016.
5. John Sonchack, Adam J. Aviv, Eric Keller, and Jonathan M. Smith. *POSTER: OFX: Enabling OpenFlow Extensions for Switch-Level Security Applications*. At the Conference on Computer Security (CCS). 2015.
6. Abdullah Ali, Ravi Kuber, and Adam J. Aviv. *H4Plock: Supporting Mobile User Authentication through Gestural Input and Tactile Output*. At the Symposium on Usable Privacy and Security (SOUPS). 2015.
7. Ethan Genco, Ryan Kelly, Cody Vernon, and Adam J. Aviv. *Alternative Keyboard Layouts for Improved Password Entry and Creation on Mobile Devices*. At the Symposium on Usable Privacy and Security (SOUPS). 2015.
8. Devon Budzitowski, Adam J. Aviv, and Ravi Kuber. *Do bigger grids sizes mean better passwords? 3x3 vs. 4x4 Grid Sizes for Android Unlock Patterns*. At the Symposium on Usable Privacy and Security (SOUPS). 2015.
9. Adam J. Aviv and Jeanne Luning-Prak. *Comparisons of Data Collection Methods for Android Graphical Pattern Unlock*. At the Symposium on Usable Privacy and Security (SOUPS). 2015.
10. Jeanne Luning-Prak and Adam J. Aviv. *A Self Reporting Survey of Android's Unlock Password*. At the Annual Computer Security Applications Conference (ACSAC). 2014.
11. Andrew G. West and Adam J. Aviv. *Measuring Privacy Disclosures in URL Query Strings*. At the USENIX Security Symposium. 2014.
12. Michael Coughlin, Oliver Michel, Eric Keller and Adam J. Aviv. *Making the Live Network the Honey-pot*. At the USENIX Symposium on Network System Design and Implementation (NSDI). 2014.
13. Dane Fichter and Adam J. Aviv. *Security and Usability Perceptions of Android Password Patterns*. At the USENIX Security Symposium. 2013.
14. Caleb Smith and Adam J. Aviv. *Entropic Return Oriented Exploit Detection*. At the USENIX Security Symposium. 2013.
15. John Sonchack, Adam J. Aviv, and Jonathan M. Smith. *Parameterized Trace Scaling*. At the USENIX Security Symposium. 2013.

GRANTS AND
FUNDING

Total Funding Participation: \$8,207,801
Funding at GW: \$778,644
Funding at USNA: \$909,670

1. PI: Google Faculty Research Award: *Security Assessment of In-App Authentication on Android*. 2020. \$78,645.
2. PI: NSF: CAREER: *Enhancing Mobile Authentication by Measuring the Authentication Life-Cycle*. 2019-2024. \$699,99.
3. PI: ONR: *New Oblivious Algorithms for Practical Applications* with Seung Geol Choi (Co-PI), Travis Mayberry (Co-PI), and Dan Roche (Co-PI). 2018-2020. \$148,947.
4. Co-PI: ONR: *Delegating Access Control using Attribute Based Encryption (ABE)* with PI Seung Geol Choi, Co-PI Daniel S. Roche, Co-PI Travis Mayberry, PI Karuna P. Joushi (UMBC), and Co-PI Tim Finnin (UMBC). 2018-2020. \$329,873 (\$109,826 at USNA).
5. PI: NSF: *SaTC Small: RUI: Achieving Practical Privacy for the Cloud* with Co-PI Daniel S. Roche, Co-PI Seung Geol Choi, and Co-PI Travis Mayberry. 2016-2019. \$354,000.
6. PI: ONR: *Tactile Authentication Methods for Mobile Devices in Cyber-Security Settings*, with PI Ravi Kuber (UMBC). 2015-2018. \$367,000 (\$34,000 at USNA).
7. Co-PI: ONR: *Ensuring Secure Cloud Services using Policybased Approaches* with Seung Geol Choi (PI), Daniel S. Roche (Co-PI), Karuna P. Joshi (PI), and Tim Finnin (Co-PI). 2015-2018. \$448,500 (\$116,180 at USNA).
8. Co-PI: NSF SaTC Medium: *Active Security*, with Eric Keller (PI) and Jonathan M. Smith (Co-PI). 2014-2018 \$1,200,000 (\$96,000 at USNA).
9. PI: ONR: *Interaction Layer Security of Tactile Devices*. 2014-2016. \$60,000.
10. Co-PI: Science of Security Lablet at UMD: PI Jonathan Katz. 2014-2016. \$4,500,000 (\$32,000 at USNA). Lablet project: *User Centered Design for Security* with Jen Golbeck as Co-PI.
11. Verisign Gift for Research Support. 2015. \$20,000
12. PI: Swarthmore College Faculty Research and Travel Support. 2012-2013. \$4,500.

PROFESSIONAL
SERVICE

- Program Committee Service
 - IEEE Symposium on Security and Privacy, 2021
 - Symposium on Usable Security and Privacy (SOUPS), 2018, 2019, 2020
 - USENIX Security Symposium (Sec’), 2018, 2019, 2020
 - Network and Distributed System Security Symposium (NDSS), 2018, 2019, 2020
 - Annual Computer Security Applications Conference (ACSAC), 2013, 2014, 2015, 2016, 2017, 2018,2019
 - Conference on Communication Security (CCS), 2019
 - European Symposium on Security and Privacy (EuroS&P), 2018
 - Workshop on Usable Security and Privacy (USEC), 2016, 2018, 2019
 - European Workshop on Usable Security and Privacy (EuroUSEC), 2017, 2018
 - New Security Paradigms Workshop (NSPW), 2017
 - Privacy Enhancing Technologies Symposium and Journal of Privacy Enhancing Technologies (PETS/JPET), 2014/2015 and 2015/2016 2016/2017
 - USENIX Workshop on the Advances in Security Education (ASE), 2016, 2017
 - Conference on emerging Networking Experiments and Technologies Student Workshop (CoNext Student), 2014

- SDN-NVF Security Workshop, 2017
- IEEE International Conference on Parallel and Distributed Systems (ICPAD), 2014
- USENIX Workshop on Cyber Security Experimentation and Test (CSET), 2013, 2014
- IEEE Vehicular Transportation Conference, Fall 2015. (Track Chair on Wireless Security), 2015
- Organizing Service
 - Posters Co-Chair: NDSS, 2018, 2019
 - Posters Co-Chair: ACSAC, 2018
 - Panels Co-Chair: ACSAC, 2016,2017
 - Steering Committee: ASE, 2016,2017,2018
 - Program Co-Chair: USENIX Workshop on Cyber Security Evaluation and Test (CSET), 2015
 - Workshops Co-Chair: Symposium on Usable Security and Privacy (SOUPS), 2016, 2017
- Service at USNA
 - IRB Member: 2016-Present
 - Division of Math and Science Senior Professor Search Committee: 2017
 - Faculty Senate IT Subcommittee: 2017-Present

TEACHING
EXPERIENCE

** indicates a course designed (or redesigned) from scratch*

1. **Instructor:** Discrete Structures I, CSCI 1311. Spring 2020. (GW)
2. **Instructor*:** Usable Security and Privacy, CSCI 3907/6907. Fall 2019. (GW)
3. **Instructor and Coordinator:** Computer Architecture and Organization, IC220. Spring 2019. (United States Naval Academy)
4. **Instructor and Coordinator*:** Computer Security: Binary Exploits and Defense, SI485. Fall 2014, 2015, 2018 and Spring 2017. (United States Naval Academy)
5. **Instructor and Coordinator:** Data Structures, IC312. Fall 2016, 2017, 2018. (United States Naval Academy)
6. **Instructor and Coordinator*:** Systems Programming, IC221. Spring 2014, 2015, 2016, 2017, 2018. (United States Naval Academy)
7. **Instructor:** Operating Systems, IC411. Spring 2016. (United States Naval Academy)
8. **Instructor:** Cyber-Security Technical Foundations, SI110. Fall 2013, 2014. (United States Naval Academy)
9. **Instructor:** Data-Structures and Algorithms, CS 35. Spring 2013. (Swarthmore College)
10. **Instructor*:** Software Engineering: Mobile Development, CS 71. Spring 2013. (Swarthmore College)
11. **Instructor*:** Computer Networks, CS 43. Fall 2012 (Swarthmore College)
12. **Instructor*:** Python Programming, CIS 192. Fall 2009, Spring 2010. (University of Pennsylvania)
13. TA: Operating Systems, CIS 380. Fall 2008, 2009, 2010, 2011 (University of Pennsylvania)

AWARDS AND
HONORS

1. 2018/2019 Nomination for the Class of 1951 Civilian Faculty Award for Excellence in Research (a United States Naval Academy award for excellences in research)
Details of the award nomination can be found here <https://www.usna.edu/Academics/Faculty-Information/Faculty-Awards.php>

2. 2017/2018 Nomination for the Apgar Award for Outstanding Teaching (a United States Naval Academy award for excellences in teaching)
Details of the award nomination can be found here <https://www.usna.edu/Academics/Faculty-Information/Faculty-Awards.php>
3. 2010/2011 University of Pennsylvania's Center for Teaching and Learning Graduate Fellowship for Teaching Excellence.
Details on the fellows program can be found here: http://www.upenn.edu/ctl/programs_services/graduate_student_programs/graduate_fellows_program
4. 2011 University of Pennsylvania's Center for Teaching and Learning Teaching Certificate.
Details of the certificate program can be found here: http://www.upenn.edu/ctl/programs_services/graduate_student_programs/ctl_teaching_certificate
5. Computer Research Association's (CRA) Outstanding Undergraduate Researcher Honorable Mention 2007, a National Award.
6. Columbia University's Theodore R. Bashkow Award Recipient 2007. A cash prize of \$200.00 presented to a computer science senior who has excelled in independent projects. This is awarded in honor of Professor Theodore R. Bashkow, whose contributions as a researcher, teacher and consultant have significantly advanced the state of the art of computer science.

PRESS COVERAGE

1. "Why you should never use pattern passwords on your phone. Facial recognition, fingerprints and iris scanning have all joined PINs, passcodes and swipe patterns. But which should you be using?" Alex Lee. Wired UK. 7 March 2020. <https://www.wired.co.uk/article/phone-lock-screen-password>
2. "Hackers May Soon Be Able to Tell What You're Typing—Just By Hearing You Type" Matthew Kassel. The Wall Street Journal. 4 June. 2019. <https://www.wsj.com/articles/hackers-may-soon-be-able-to-tell-what-youre-typing-just-by-hearing-you-type-11559700120>
3. "Don't Rely on an Unlock Pattern to Secure Your Android Phone." Andrew Greenberg. Wired.com. 22 Sep. 2017. <https://www.wired.com/story/android-unlock-pattern-or-pin/>
4. "Don't Use Patterns To Unlock Your Android Phone, Study Suggests." Carl Velasco. Tech Times. 23 Sep. 2017. <http://www.techtimes.com/articles/213729/20170923/dont-use-patterns-to-unlock-your-android-phone-study-suggests.htm>
5. "Android Passcodes Deciphered by Smudges." Jared Newma. Gadgetwise: The New York Times Blog. 12 Aug. 2010. <https://gadgetwise.blogs.nytimes.com/2010/08/12/android-passcodes-deciphered-by-finger-smudges/>
6. "Smartphone smudges can reveal password, study finds." Evan Koblentz. The Christian Science Monitor. 18 Aug. 2010 <https://www.csmonitor.com/Science/2010/0818/Smartphone-smudges-can-reveal-password-study-finds>