

Jason Polakis

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Research Interests

My research interests span several areas of security and privacy. In the past few years I have focused on understanding the security limitations of online social networks, exploring the privacy threats that users face, and designing robust countermeasures. I have also explored alternative user authentication techniques, and access control mechanisms for shared content that strengthen user privacy. I am also interested in the usable aspect of security, and analyzing/designing next generation CAPTCHA systems. I have also explored various other topics of web and network security.

Education

February 2014 **Ph.D. in Computer Science**, *University Of Crete*, Department of Computer Science, Heraklion, Crete, Greece.

Thesis — Online Social Networks from a Malicious Perspective: Novel Attack Techniques and Defense Mechanisms

Advisor: Prof. Evangelos P. Markatos

October 2009 **M.Sc. in Computer Science**, *University Of Crete*, Department of Computer Science, Heraklion, Crete, Greece.

Thesis — Exploring HoneyPot Technologies for Malware Collection and Cyber-attack Information Acquisition

Advisor: Prof. Evangelos P. Markatos

September 2007 **B.Sc. in Computer Science**, *University of Crete*, Department of Computer Science, Heraklion, Crete, Greece.

Thesis — A System for Analyzing Malware Based on Behavioral Profiling

Advisor: Prof. Evangelos P. Markatos

Honors and Awards

2015 Google Vulnerability Reward **Hall of Fame**

November 2014 Facebook **bug bounty award**

Summer 2012 **Scholarship** for Researcher Mobility
European Union Seventh Framework Programme Project SysSec

October 2007 - **Research Scholarship** (graduate)

March 2014 Institute of Computer Science, Foundation Of Research and Technology Hellas (FORTH)

Sept. 2006 - **Research Scholarship** (undergraduate)
Sept. 2007 Institute of Computer Science, Foundation Of Research and Technology Hellas (FORTH)

Research Experience

2014 – 2016 **Postdoctoral Research Scientist**, *Network Security Lab*, Columbia University.
Participation in the NSF-funded project VPSN (virtual private social networks).

July 2006 – **Research Assistant / R&D engineer**, *Distributed Computing Systems Lab*, Institute of
March 2014 Computer Science, Foundation Of Research and Technology Hellas.
Participation in the EU-funded projects NoAH (network of affined honeypots), WOMBAT (malware collection and analysis), SysSec (managing future threats and vulnerabilities), NECOMA (data collection and analysis for cyberdefense), ForToo (forensics tools for the identification, analysis and visualization of attacks).

July, November **Visiting Scholar**, *NECST Lab*, Politecnico Di Milano.
2012 Work on designing a robust Social Authentication mechanism, as part of the SysSec project.

Teaching

Fall 2018 **ENGR 194: Intro to CyberSecurity**, *University of Illinois at Chicago*.
students: 21

Spring 2018 **CS 594: Security and Privacy in the Age of the Social Web**, *University of Illinois at Chicago*.
students: 7

Fall 2017 **ENGR 194: CyberSecurity Foundations**, *University of Illinois at Chicago*.
students: 30

Spring 2017 **CS 377 – Communication and Ethical Issues in Computing**, *University of Illinois at Chicago*.
students: 60

Fall 2016 **CS 594 – Security and Privacy in the Age of the Social Web**, *University of Illinois at Chicago*.
students: 19

Students

Student Advising

08/2018–present Xu Lin (PhD student; University of Illinois at Chicago)

08/2017–present Soroush Karami (PhD student; University of Illinois at Chicago)

- 01/2017–present Saumya Solanki (M.Sc., PhD student; University of Illinois at Chicago)
- 01/2018–09/2018 Francesco Marcantoni (M.Sc., University of Illinois at Chicago)
- 01/2017–08/2017 Lara Ansari (M.Sc. student; University of Illinois at Chicago)
- 01/2017–08/2017 Amrutha Ramesh (M.Sc. student; University of Illinois at Chicago)
- 01/2017–08/2017 Varshini Sampath (M.Sc. student; University of Illinois at Chicago)
- 01/2017–08/2017 Gautam Krishnan (M.Sc. student; University of Illinois at Chicago)
- 2014–2016 Suphanee Sivakorn (Ph.D. student; Columbia University), co-supervised with Professor Angelos D. Keromytis

Student Mentoring

- 2016–present Kostas Drakonakis (M.Sc. student; University of Crete)
- 2014–2015 George Argyros (Ph.D. student; Columbia University)
- 2014–2015 Theofilos Petsios (Ph.D. student; Columbia University)
- 2013–present Panagiotis Ilia (Ph.D. student; University of Crete)
- 2013–2014 Despoina Antonakaki (Ph.D. student; University of Crete)
- 2013–2015 Markos Aivazoglou (Undergraduate student; University of Crete)
- 2013–2015 Orestes Roussos (Undergraduate student; University of Crete)
- 2013–present Michalis Diamantaris (B.Sc., M.Sc., PhD student; University of Crete)
- 2013–2014 Elias Diamantakos (Undergraduate student; University of Crete)
- 2012–2013 Stamatis Volanis (M.Sc. student; University of Crete)
- 2012–2013 Nikos Toullos (Undergraduate student; University of Crete)
- 2012–2013 Marco Lancini (M.Sc. student; Politecnico Di Milano)

- 2010–2011 Giannis Pistas (Undergraduate student; University of Crete)
- 2010–2011 Nikos Zorakis (Undergraduate student; University of Crete)
- 2009–2011 Georgios Kontaxis (M.Sc. student; University of Crete)

Service

Program Committee

- MADWeb** Workshop on Measurements, Attacks, and Defenses for the Web 2019
- WWW** International World Wide Web Conference, Security & Privacy track 2018
- EuroSec** European Workshop on Systems Security 2018, 2019
- CCSW** Cloud Computing Security Workshop 2017
- RAID** International Symposium on Research in Attacks, Intrusions and Defenses 2017, 2018
- eCrime** Symposium on Electronic Crime Research 2017
- DSN** International Conference on Dependable Systems and Networks 2017
- DIMVA** International Conference on Detection of Intrusions and Malware & Vulnerability Assessment, 2015, 2016, 2017
- UEOP** Workshop on Understanding and Enhancing Online Privacy, 2016

Reviewer

- TOIT** IEEE Transactions on Internet Technology, 2017.
- CL** IEEE Communications Letters, 2013.
- TETC** IEEE Transactions on Emerging Topics in Computing, 2014.
- COMCOM** Computer Communications, 2014.

External Reviewer

- CCS** ACM Conference on Computer and Communications Security, 2012, 2013, 2014.
- ASPLOS** ACM International Conference on Architectural Support for Programming Languages and Operating Systems, 2012.
- RAID** International Symposium on Research in Attacks Intrusions and Defenses, 2009.
- IMC** ACM Internet Measurement Conference, 2007, 2014.
- ACNS** International Conference on Applied Cryptography and Network Security, 2011.
- ASIACCS** ACM Symposium on InformAtion, Computer and Communications Security, 2015.
- FC** International Conference on Financial Cryptography and Data Security, 2011.
- EuroSec** European Workshop on Systems Security, 2009.
- SESOC** IEEE International Workshop on SEcurity and SOcial Networking, 2011.
- ISCC** IEEE Symposium on Computers and Communications, 2011.
- IFIP SEC** IFIP International Information Security and Privacy Conference, 2012.

Press and Media Coverage

- 10/02/2018 **The New York Times** *Why You Shouldn't Use Facebook to Log In to Other Sites* <https://nyti.ms/2Ni6JlB>
- 10/02/2018 **WIRED** *The Facebook hack exposes an Internet-wide failure* <https://bit.ly/2xT1aFt>
- 10/04/2018 **CNN** *Tinder, Pinterest and others struggle to determine how Facebook hack affects their users* <https://cnn.it/2OPrytC>
- 10/02/2018 **The New York Times** *Facebook Hack Puts Thousands of Other Sites at Risk* <https://nyti.ms/2DZMFVw>
- 08/04/2016 **Threat Post** *Lack of Encryption Leads to Large Scale Cookie Exposure* <https://goo.gl/uIITKg>
- 04/07/2016 **The Register** *Google, Facebook's CAPTCHAs vanquished by security researchers* <http://goo.gl/M8WkRb>
- 04/07/2016 **Softpedia** *Google reCAPTCHA Cracked in New Automated Attack* <http://goo.gl/H9hgGs>
- 04/07/2016 **Slashdot** *Google ReCAPTCHA Cracked In New Automated Attack* <https://goo.gl/azI0gl>
- 04/07/2016 **Gizmodo** *Bots Can Now Fool Human-Verifying CAPTCHAs* <http://goo.gl/gnrIQY>
- 04/07/2016 **SC Magazine** *Security researchers defeat reCAPTCHA* <http://goo.gl/VB0iSQ>
- 04/08/2016 **The Inquirer** *Bake your own cookies to crack Google's Captchas, say researchers* <http://goo.gl/wvRgMD>
- 04/08/2016 **Sophos** *Solving Google reCAPTCHAs – without using humans* <https://goo.gl/8xAMbm>
- 04/19/2016 **Kaspersky** *Google's reCAPTCHA defeated by security researchers* <https://goo.gl/IF177q>
- 12/06/2012 **Computer World** *All your faces belong to us: Breaking Facebook's Social Authentication* <http://goo.gl/k8Qh8U>

Talks, Lectures, Presentations

Invited Talks

- **Location Verification in Location-based Services**

July 2012 Politecnico Di Milano, *Host*: Stefano Zanero

June 2013 Columbia University, *Host*: Angelos D. Keromytis

Conference and Workshop Presentations

- May 2018 **In Deep Trouble: Bot Prevention in the Age of Deep Learning**
USENIX ScAI Net 2018, Atlanta, GA, USA.
- August 2016 **HTTP Cookie Hijacking in the Wild: Security and Privacy Implications**
Blackhat USA, Las Vegas, NV, USA.
- November 2015 **Where's Wally? Precise User Discovery Attacks in Location Proximity Services**
Conference on Computer and Communications Security (CCS), Denver, CO, USA.
- November 2014 **Faces in The Distorting Mirror: Revisiting Photo-based Social Authentication**
Conference on Computer and Communications Security (CCS), Scottsdale, AZ, USA.
- September 2014 **Security and Privacy Measurements in Social Networks: Experiences and Lessons Learned**
International Workshop on Building Analysis Datasets and Gathering Experience Returns for Security (BADGERS), Wroclaw, Poland.
- December 2013 **The Man Who Was There: Validating Check-ins in Location-based Services**
Annual Computer Security Applications Conference (ACSAC), New Orleans, LA, USA.
- December 2012 **All Your Face Are Belong to Us: Breaking Facebook's Social Authentication**
Annual Computer Security Applications Conference (ACSAC), Orlando, FL, USA.
- September 2011 **dead.drop: URL-based Stealthy Messaging**
European Conference on Computer Network Defense (EC2ND), Gothenburg, Sweden.
- July 2011 **CAPTCHuring Automated (Smart)Phone Attacks**
Workshop on Systems Security (SysSec), Amsterdam, Netherlands.
- March 2011 **Detecting Social Network Profile Cloning**
IEEE International Workshop on SEcurity and SOCial Networking (SESOC), Seattle, USA.
- October 2010 **Using Social Networks to Harvest Email Addresses**
Workshop on Privacy in the Electronic Society (WPES), Chicago, IL, USA.
- September 2010 **D(e|i)aling with VoIP: Robust Prevention of DIAL Attacks**
European Symposium on Research in Computer Security (ESORICS), Athens, Greece.
- March 2010 **A systematic characterization of IM threats using honeypots**
Network and Distributed System Security Symposium (NDSS), San Diego, CA, USA.

Peer-reviewed Publications

Conference and Workshop Proceedings

M. Diamantaris, E. Papadopoulos, E.P. Markatos, S. Ioannidis, and **J. Polakis**. REAPER: Real-time App Analysis for Augmenting the Android Permission System In *9th ACM Conference on Data and Application Security and Privacy (CODASPY)*, March 2019, Dallas, TX. [Acceptance Rate: 23.5%]

K. Drakonakis, P. Ilia, S. Ioannidis, and **J. Polakis**. Please Forget Where I Was Last Summer: The Privacy Risks of Public Location (Meta)Data In *Proceedings of the 25th Network and Distributed System Security Symposium (NDSS)*, February 2019, San Diego, CA. [Acceptance Rate: 17%]

M. Ghasemisharif, A. Ramesh, S. Checkoway, C. Kanich, and **J. Polakis**. O Single Sign-Off, Where Art Thou? An Empirical Analysis of Single Sign-On Account Hijacking and Session Management on the Web In *Proceedings of the 27th USENIX Security Symposium*, August 2018, Baltimore, MD. [Acceptance Rate: 19%]

S. Solanki, G. Krishnan, V. Sampath, and **J. Polakis**. In (Cyber)Space Bots Can Hear You Speak: Breaking Audio CAPTCHAs Using OTS Speech Recognition. In *Proceedings of the 10th ACM Workshop on Artificial Intelligence and Security (AISec)* November 2017, Dallas, TX, USA.

Markos Aivazoglou, Orestis Roussos, Sotiris Ioannidis, Dimitris Spiliotopoulos, and **J. Polakis**. Reveal: Fine-grained Recommendations in Online Social Networks. In *Proceedings of the 2017 IEEE/ACM International Conference on Advances in Social Networks Analysis and Mining (ASONAM)*, July 2017, Sydney, Australia.

I. Agadacos, **J. Polakis**, and G. Portokalidis. Techu: Open and Privacy-preserving Crowdsourced GPS for the Masses. In *Proceedings of the 15th ACM International Conference on Mobile Systems, Applications, and Services (MobiSys)*, June 2017, Niagara Falls, NY. [Acceptance Rate: 18%]

S. Sivakorn, A. D. Keromytis, and **J. Polakis**. That's the Way the Cookie Crumbles: Evaluating HTTPS Enforcing Mechanisms. In *Proceedings of the 15th ACM Workshop on Privacy in the Electronic Society (WPES)* October 2016, Vienna, Austria [Acceptance Rate: 19.4%]

S. Sivakorn*, **I. Polakis***, and A. D. Keromytis. The Cracked Cookie Jar: HTTP Cookie Hijacking and the Exposure of Private Information. In *Proceedings of the 37th IEEE European Symposium on Security and Privacy (Oakland)*, May 2016, San Jose, CA.. [Acceptance Rate: 13.3%] *Joint primary authors

S. Sivakorn, **I. Polakis**, and A. D. Keromytis. I Am Robot: (Deep) Learning to Break Semantic Image CAPTCHAs. In *Proceedings of the 1st IEEE European Symposium on Security and Privacy (EuroS&P)*, March 2016, Saarbrücken, Germany. [Acceptance rate: 17.3%]

I. Polakis, P. Iliia, Z. Tzermias, S. Ioannidis, P. Fragopoulou. Social Forensics: Searching for Needles in Digital Haystacks. In *Proceedings of the 4th International Workshop on Building Analysis Datasets and Gathering Experience Returns for Security (BADGERS)*, co-located with the 18th International Symposium on Research in Attacks, Intrusions and Defenses (RAID), November 2015, Kyoto, Japan.

I. Polakis, G. Argyros, T. Petsios, S. Sivakorn, and A. D. Keromytis. Where's Wally? Precise User Discovery Attacks in Location Proximity Services. In *Proceedings of the 22nd ACM Conference on Computer and Communications Security (CCS)*, October 2015, Denver, CO, USA. [Acceptance rate: 19.4%]

P. Iliia, **I. Polakis**, E. Athanasopoulos, F. Maggi, and S. Ioannidis. Face/Off: Preventing Privacy Leakage From Photos in Social Networks. In *Proceedings of the 22nd ACM Conference on Computer and Communications Security (CCS)*, October 2015, Denver, CO, USA. [Acceptance rate: 19.4%]

I. Polakis, M. Diamantaris, T. Petsas, F. Maggi, and S. Ioannidis. Powerslave: Analyzing the Energy Consumption of Mobile Antivirus Software. In *Proceedings of the 12th Detection of Intrusions and Malware, and Vulnerability Assessment (DIMVA)*, July 2015, Milan, Italy. [Acceptance rate: 22.6%]

D. Antonakaki, **I. Polakis**, E. Athanasopoulos, P. Fragopoulou, and S. Ioannidis. Think before RT: An Experimental Study of Abusing Twitter Trends. In *Proceedings of the Workshop On Social Influence (SI)*, co-located with the 6th International Conference on Social Informatics (SoCInfo), November 2014, Barcelona, Spain.

I. Polakis, P. Iliia, F. Maggi, M. Lancini, G. Kontaxis, S. Zanero, S. Ioannidis, and A. D. Keromytis. Faces in the Distorting Mirror: Revisiting Photo-based Social Authentication. In *Proceedings of the 21st ACM Conference on Computer and Communications Security (CCS)*, November 2014, Arizona, USA. [Acceptance rate: 19.4%]

I. Polakis, F. Maggi, S. Zanero, and A. D. Keromytis. Security and Privacy Measurements in Social Networks: Experiences and Lessons Learned. In *Proceedings of the 3rd International Workshop on Building Analysis Datasets and Gathering Experience Returns for Security (BADGERS)*, co-located with the 19th European Symposium on Research in Computer Security (ESORICS), September 2014, Wroclaw, Poland.

I. Polakis, S. Volanis, E. Athanasopoulos, and E. P. Markatos. The Man Who Was There: Validating Check-ins in Location-based Services. In *Proceedings of the 29th Annual Computer Security Applications Conference (ACSAC)*, December 2013, New Orleans, USA. [Acceptance rate: 19.9%]

I. Polakis, M. Lancini, G. Kontaxis, F. Maggi, S. Ioannidis, A. D. Keromytis, and S. Zanero. All Your Face Are Belong to Us: Breaking Facebook's Social Authentication. In *Proceedings of the 28th Annual Computer Security Applications Conference (ACSAC)*, December 2012, Florida, USA. [Acceptance rate: 19%]

G. Kontaxis, **I. Polakis**, M. Polychronakis, and E. P. Markatos. dead.drop: URL-based Stealthy Messaging. In *Proceedings of the 7th European Conference on Computer Network Defense (EC2ND)*. September 2011, Gothenburg, Sweden.

I. Polakis, G. Kontaxis and S. Ioannidis. CAPTCHuring Automated (Smart)Phone Attacks. In *Proceedings of the 1st Workshop on Systems Security (SysSec) co-located with the 8th conference on Detection of Intrusions and Malware and Vulnerability Assessment (DIMVA 2011)*, July 2011, Amsterdam, Netherlands.

G. Kontaxis, **I. Polakis**, and S. Ioannidis. Outsourcing Malicious Infrastructure to the Cloud. In *Proceedings of the 1st Workshop on Systems Security (SysSec), co-located with the 8th conference on Detection of Intrusions and Malware and Vulnerability Assessment (DIMVA 2011)*, July 2011, Amsterdam, Netherlands.

G. Kontaxis, Demetres Antoniadou, **Iasonas Polakis**, and E. P. Markatos. An Empirical Study on the Security of Cross-Domain Policies in Rich Internet Applications. In *Proceedings of the European Workshop on System Security (EUROSEC)*, April 2011, Salzburg, Austria.

D. Antoniadou, **I. Polakis**, G. Kontaxis, E. Athanasopoulos, S. Ioannidis, E. P. Markatos, and T. Karagiannis. we.b: The web of short URLs. In *Proceedings of the 20th International World Wide Web Conference (WWW)*, March 2011 Hyderabad, India. [Acceptance rate (full papers): 12.4%]

G. Kontaxis, **I. Polakis**, S. Ioannidis, and E. P. Markatos. Detecting Social Network Profile Cloning. In *Proceedings of the 3rd IEEE International Workshop on Security and Social Networking (SESOC)*. March 2011 Seattle, WA.

I. Polakis, G. Kontaxis, S. Antonatos, E. Gessiou, T. Petsas, and E. P. Markatos. Using Social Networks to Harvest Email Addresses. In *Proceedings of the 9th Workshop on Privacy in the Electronic Society (WPES)*, October 2010, Chicago, IL. [Acceptance rate (full papers): 20.8%]

G. Kontaxis, **I. Polakis**, S. Antonatos, and E. P. Markatos. Experiences and observations from the NoAH infrastructure. In *Proceedings of the 6th European Conference on Computer Network Defense (EC2ND)*, October 2010, Berlin, Germany.

A. Kapravelos, **I. Polakis**, E. Athanasopoulos, S. Ioannidis, and E. P. Markatos. D(eli)aling with VoIP: Robust Prevention of DIAL Attacks. In *Proceedings of the 15th European Symposium on Research in Computer Security (ESORICS)*, September 2010, Athens, Greece. [Acceptance rate: 20.8%]

S. Antonatos, **I. Polakis**, Thanasis Petsas, and E. P. Markatos. A systematic characterization of IM threats using honeypots. In *Proceedings of the 17th Annual Network and Distributed System Security Symposium (NDSS)*, March 2010, San Diego, CA, USA. [Acceptance rate: 15.4%]

Journal Proceedings

- [J.1] G. Argyros, T. Petsios, S. Sivakorn, A. D. Keromytis, and **J. Polakis**. Evaluating the Privacy Guarantees of Location Proximity Services In *ACM Transactions on Privacy and Security (TOPS)*, 19, 4, Article 12 (February 2017) – (formerly TISSEC).
- [J.2] D. Antonakaki, **I. Polakis**, E. Athanasopoulos, P. Fragogioulou, and S. Ioannidis. Exploiting abused trending topics to identify spam campaigns in Twitter. In *Social Network Analysis and Mining*, 6(1).

Posters

- [P.1] **I. Polakis**, G. Kontaxis, S. Ioannidis, and E. P. Markatos. Dynamic Monitoring of Dark IP Address Space. In *3rd COST TMA International Workshop on Traffic Monitoring and Analysis (TMA)*, April 2011, Vienna, Austria.

Non-refereed Publications

Technical Reports

- [TR.1] **I. Polakis**, G. Argyros, T. Petsios, S. Sivakorn, and A. D. Keromytis. Where's Wally? Precise User Discovery Attacks in Location Proximity Services. Technical Report CUCS-012-15, Department of Computer Science, Columbia University.
- [TR.2] A. Kapravelos, **I. Polakis**, E. Athanasopoulos, S. Ioannidis, and E. P. Markatos. Digital is Calling the Analog: Robust Prevention of Dial Attacks. Technical Report 399, FORTH-ICS, October 2009.

Book Chapters, Articles

- [B.1] **The Red Book: A Roadmap for Systems Security Research**. Evangelos P. Markatos and Davide Balzarotti (editors). The SysSec Consortium, August 2013.
- [B.2] **Honeypot Technologies** - PenTest Magazine. Iasonas Polakis and Spiros Antonatos, September 2012.