

Hao Chen

Department of Computer Science, University of California
Davis, CA 95616-5270, USA

☎ +1 530 754 5375 • ✉ chen@ucdavis.edu
🌐 www.cs.ucdavis.edu/~hchen/

Research interests

Computer security, machine learning, mobile computing

Education

University of California <i>PhD in Computer Science</i>	Berkeley, USA 1998-08 – 2004-06
Southeast University <i>MS in Biomedical Engineering</i>	Nanjing, China 1991-09 – 1994-06
Southeast University <i>BS in Biomedical Engineering</i>	Nanjing, China 1988-09 – 1991-06

Appointments

Department of Computer Science, University of California <i>Professor</i>	Davis, CA, USA 2016-07 – present
Department of Computer Science, University of California <i>Associate Professor</i>	Davis, CA, USA 2010-07 – 2016-06
Department of Computer Science, University of California <i>Assistant Professor</i>	Davis, CA, USA 2004-07 – 2010-06

Honors and awards

UC Davis <i>Outstanding Engineering Faculty Award</i>	2010
NSF <i>CAREER Award</i>	2007

Teaching

- Undergraduate courses.....
- Computer Security
 - Data Structures and Programming
 - Introduction to Software Development
- Graduate courses.....
- Computer Security

o Software Security

Students

Doctoral: Liang Cai, Jonathan Crussell, Benjamin Davis, Clint Gibler, Francis Hsu, Gabriel Maganis, Yuan Niu, Ryan Stevens, Matthew Van Gundy

Master: Jeremy Erickson, Eric Gustafson, Kristen Kennedy, Denys Ma, Radmillo Racic, Jonathan Vronsky

Services

Chair of program committee.....

MoST: IEEE Mobile Security Technologies 2012, 2013

Member of program committee.....

CCS: ACM Conference on Computer and Communications Security 2017

CNS: IEEE Conference on Communications and Network Security 2013–2017

ASIACCS: ACM Asia Conference on Computer and Communications Security 2006, 2016–2017

MoST: IEEE Mobile Security Technologies 2012–2017

INFOCOM: IEEE International Conference on Computer Communications 2016

S&P: IEEE Symposium on Security and Privacy 2009, 2015

MobiSys: International Conference on Mobile Systems, Applications, and Services 2015

CANS: International Conference on Cryptology and Network Security 2015

ACSAC: Annual Computer Security Applications Conference 2012–2013

WWW: World Wide Web Conference 2012

WiSec: ACM Conference on Wireless Network Security 2011, 2016

NDSS: Network and Distributed System Security Symposium 2006, 2008–2011

SecureComm: International Conference on Security and Privacy in Communication Networks 2007–2012

W2SP: IEEE Web 2.0 Security and Privacy 2009–2011, 2013

ICDCS: International Conference on Distributed Computing Systems 2008

Security: Usenix Security Symposium 2007

Funding

Science and Technology Center for Secure Computing (ISTC-SC) **\$150 000**
Intel, PI 2013-10 – 2017-09

Research Investments in the Sciences and Engineering (RISE) **\$860 000**
UC Davis, co-PI 2012-09 – 2015-08

Designing New Authentication Mechanisms using Hardware Capabilities in Advanced Mobile Devices **\$500 000**
NSF CNS-1018964, PI 2010-08 – 2014-07

Practical Privacy Preserving Technologies **\$300 000**
NSF CNS-0831547, co-PI 2008-11 – 2012-10

Leveraging Cellular Networks for Web Authentication <i>University of California MICRO, PI</i>	\$11 250 2008-08 – 2009-12
CAREER: Securing Broadband Cellular Data Networks <i>NSF CNS-0644450, PI</i>	\$400 000 2007-07 – 2013-06
Helix: A Self-Regenerative Architecture for the Incorruptible Enterprise <i>AFOSR, PI</i>	\$1 646 000 2007-05 – 2012-04
Institute for Information Infrastructure Protection Fellowship <i>I3P, PI</i>	\$150 000 2005-09 – 2007-08
CT-ISG: Reasoning about Composable Intrusion Detection Systems <i>NSF CNS-0524826, PI</i>	\$179 110 2005-10 – 2006-09
NeTS-NBD: Automatic Validation, Optimization, and Adaptation of Distributed Firewalls for Network Performance and Security <i>NSF CNS-0520320, co-PI</i>	\$400 000 2005-09 – 2008-08
Gift <i>Sprint, PI</i>	\$60 000 2007, 2008
Gift <i>Microsoft, PI</i>	\$5 000 2007
Gift <i>Intel, co-PI</i>	\$150 000 2005

Publications

- [1] Dongyu Meng and Hao Chen. “MagNet: a Two-Pronged Defense against Adversarial Examples”. In: *ACM Conference on Computer and Communications Security (CCS)*. Dallas, TX, Oct. 30–Nov. 3, 2017.
- [2] Yuanyi Wu, Dongyu Meng, and Hao Chen. “Evaluating Private Modes in Desktop and Mobile Browsers and Their Resistance to Fingerprinting”. In: *IEEE Conference on Communications and Network Security (CNS)*. Las Vegas, NV, Oct. 9–11, 2017.
- [3] Jonathan Vronsky, Ryan Stevens, and Hao Chen. “SurgeScan: Enforcing Security Policies on Untrusted Third-Party Android Libraries”. In: *The 14th IEEE Conference on Advanced and Trusted Computing (ATC)*. San Francisco, CA, Aug. 4–8, 2017.
- [4] Yuan Zhang, Min Yang, Guofei Gu, and Hao Chen. “Rethinking Permission Enforcement Mechanism on Mobile Systems”. In: *IEEE Transactions on Information Forensics & Security* 11.10 (2016), pp. 2227–2240.
- [5] Peng Chen and Hao Chen. “Security Analysis of Personal Unmanned Aerial Vehicles”. In: *International Conference on Security and Privacy in Communication Networks (SECURECOMM)*. Guangzhou, China, Oct. 10–12, 2016.
- [6] Zhengyang Qu, Guanyu Guo, Zhengyue Shao, Vaibhav Rastogi, Yan Chen, Hao Chen, and Wangjun Hong. “AppShield: Enabling Multi-entity Access Control Cross Platforms for Mobile App Management”. In: *International Conference on Security and Privacy in Communication Networks (SECURECOMM)*. Guangzhou, China, Oct. 10–12, 2016.
- [7] Zheran Fang, Weili Han, Dong Li, Zeqing Guo, Danhao Guo, X. Sean Wang, Zhiyun Qian, and Hao Chen. “revDroid: Code Analysis of the Side Effects after Dynamic Permission Revo-

- cation of Android Apps". In: *ACM Asia Conference on Computer and Communications Security (ASIACCS)*. Xi'an, China, May 30–June 3, 2016.
- [8] Ryan Stevens, Jonathan Crussell, and Hao Chen. "On the Origin of Mobile Apps: Network Provenance for Android Applications". In: *6th ACM Conference on Data and Application Security and Privacy (CODASPY)*. New Orleans, LA, Mar. 9–11, 2016.
 - [9] Jonathan Crussell, Clint Gibler, and Hao Chen. "AnDarwin: Scalable Detection of Android Application Clones Based on Semantics". In: *IEEE Transactions on Mobile Computing* 14.10 (2015), pp. 2007–2019.
 - [10] Ryan Stevens and Hao Chen. "Predictive Eviction: A Novel Policy for Optimizing TLS Session Cache Performance". In: *IEEE Global Communications Conference: Communications and Information System Security (GLOBECOM)*. San Diego, CA, Dec. 6–10, 2015.
 - [11] Yuan Zhang, Min Yang, Guofei Gu, and Hao Chen. "FineDroid: Enforcing Permissions with System-wide Application". In: *International Conference on Security and Privacy in Communication Networks (SECURECOMM)*. Dallas, TX, Oct. 26–29, 2015.
 - [12] Fangda Cai, Hao Chen, Yuanyi Wu, and Yuan Zhang. "AppCracker: Widespread Vulnerabilities in User and Session Authentication in Mobile Apps". In: *IEEE Mobile Security Technologies (MoST)*. San Jose, CA, May 21, 2015.
 - [13] Jonathan Crussell, Ryan Stevens, and Hao Chen. "MAdFraud: Investigating Ad Fraud in Android Applications". In: *12th International Conference on Mobile Systems, Applications and Services (MobiSys)*. Bretton Woods, NH, USA, June 16–19, 2014.
 - [14] Daniel Defreez, Bhargava Shastry, Hao Chen, and Jean-Pierre Seifert. "A First Look at Firefox OS Security". In: *IEEE Mobile Security Technologies (MoST)*. San Jose, CA, May 17, 2014.
 - [15] Claire Le Goues, Anh Nguyen-Tuong, Hao Chen, Jack W. Davidson, Stephanie Forrest, Jason D. Hiser, John C. Knight, and Matthew Van Gundy. "Moving Target Defenses in the Helix Self-Regenerative Architecture". In: *Moving Target Defense II: Application of Game Theory and Adversarial Modeling*. Ed. by Sushil Jajodia et al. Springer-Verlag New York, 2013, pp. 117–149.
 - [16] Daryl Posnett, David Kavalier, Clint Gibler, Hao Chen, Prem Devanbu, and Vladimir Filkov. "Using and Asking: APIs Used in the Android Market and Asked About in StackOverflow". In: *5th International Conference on Social Informatics (SocInfo)*. Kyoto, Japan, Nov. 25–27, 2013.
 - [17] Jonathan Crussell, Clint Gibler, and Hao Chen. "Scalable Semantics-Based Detection of Similar Android Applications". In: *18th European Symposium on Research in Computer Security (ESORICS)*. Egham, U.K., Sept. 9–13, 2013.
 - [18] Benjamin Davis and Hao Chen. "Retrofitting Android Apps". In: *11th International Conference on Mobile Systems, Applications and Services (MobiSys)*. Taipei, Taiwan, June 25–28, 2013.
 - [19] Clint Gibler, Ryan Stevens, Jon Crussell, Hao Chen, Hui Zang, and Heesook Choi. "Characterizing Android Application Plagiarism and its Impact on Developers". In: *11th International Conference on Mobile Systems, Applications and Services (MobiSys)*. Taipei, Taiwan, June 25–28, 2013.
 - [20] Eric Gustafson, Kristen Kennedy, and Hao Chen. "Quantifying the Effects of Removing Permissions from Android Applications". In: *IEEE Mobile Security Technologies (MoST)*. San Francisco, CA, May 23, 2013.
 - [21] Ryan Stevens, Jonathan Ganz, Prem Devanbu, Hao Chen, and Vladimir Filkov. "Asking for (and About) Permissions Used by Android Apps". In: *10th Working Conference on Mining Software Repositories (MSR)*. San Francisco, CA, May 18–19, 2013.

- [22] Matthew Van Gundy and Hao Chen. "Noncespaces: Using randomization to defeat cross-site scripting attacks". In: *Computers & Security* 31.4 (2012), pp. 612–628.
- [23] Jonathan Crussell, Clint Gibler, and Hao Chen. "Attack of the Clones: Detecting Cloned Applications on Android Markets". In: *17th European Symposium on Research in Computer Security (ESORICS)*. Pisa, Italy, Sept. 10–12, 2012.
- [24] Liang Cai and Hao Chen. "On the Practicality of Motion Based Keystroke Inference Attack". In: *5th International Conference on Trust & Trustworthy Computing (TRUST)*. Vienna, Austria, June 13–15, 2012.
- [25] Clint Gibler, Jon Crussell, Jeremy Erickson, and Hao Chen. "AndroidLeaks: Automatically Detecting Potential Privacy Leaks In Android Applications on a Large Scale". In: *5th International Conference on Trust & Trustworthy Computing (TRUST)*. Vienna, Austria, June 13–15, 2012.
- [26] Gabriel Maganis, Elaine Shi, Hao Chen, and Dawn Song. "Opaak: Using Mobile Phones to Limit Anonymous Identities Online". In: *10th International Conference on Mobile Systems, Applications and Services (MobiSys)*. Low Wood Bay, Lake District, United Kingdom, June 26–28, 2012.
- [27] Benjamin Davis, Hao Chen, and Matthew Franklin. "Privacy-Preserving Alibi Systems". In: *7th ACM Symposium on Information, Computer and Communications Security (ASIACCS)*. Seoul, South Korea, May 1–3, 2012.
- [28] Benjamin Davis, Ben Sanders, Armen Khodaverdian, and Hao Chen. "I-ARM-Droid: A Rewriting Framework for In-App Reference Monitors for Android Applications". In: *IEEE Mobile Security Technologies (MoST)*. San Francisco, CA, May 24, 2012.
- [29] Ryan Stevens, Clint Gibler, Jon Crussell, Jeremy Erickson, and Hao Chen. "Investigating User Privacy in Android Ad Libraries". In: *IEEE Mobile Security Technologies (MoST)*. San Francisco, CA, May 24, 2012.
- [30] Francis Hsu, Hao Chen, and Sridhar Machiraju. "WebCallerID: Leveraging Cellular Networks for Web Authentication". In: *Journal of Computer Security* 19.5 (2011).
- [31] Liang Cai and Hao Chen. "TouchLogger: Inferring Keystrokes On Touch Screen From Smartphone Motion". In: *6th USENIX Workshop on Hot Topics in Security (HotSec 11)*. San Francisco, CA, Aug. 2011.
- [32] Yuan Niu and Hao Chen. "Gesture Authentication with Touch Input for Mobile Devices". In: *3rd International Conference on Security and Privacy in Mobile Information and Communication Systems (MobiSec)*. Aalborg, Denmark, May 2011.
- [33] Liang Cai, Kai Zeng, Hao Chen, and Prasant Mohapatra. "Good Neighbor: Ad Hoc Pairing of Nearby Wireless Devices by Multiple Antennas". In: *Annual Network and Distributed System Security Symposium (NDSS)*. San Diego, CA, Feb. 2011.
- [34] Radmilo Racic, Denys Ma, Hao Chen, and Xin Liu. "Exploiting and Defending Opportunistic Scheduling in Cellular Data Networks". In: *IEEE Transactions on Mobile Computing* 9 (2010), pp. 609–620. ISSN: 1536-1233.
- [35] Benjamin Davis and Hao Chen. "DBTaint: Cross-Application Information Flow Tracking via Databases". In: *USENIX Conference on Web Application*. Boston, MA, June 23–24, 2010.
- [36] Liang Cai, Sridhar Machiraju, and Hao Chen. "CapAuth: A Capability-based Handover Scheme". In: *IEEE INFOCOM 2010: The 27th Conference on Computer Communications*. San Diego, CA, Mar. 2010.

- [37] Ian Goldberg, Berkant Ustaoglu, Matthew Van Gundy, and Hao Chen. "Multi-party Off-the-Record Messaging". In: *Proceedings of the 16th ACM Conference on Computer and Communications Security (CCS)*. Chicago, IL, Nov. 2009.
- [38] Francis Hsu and Hao Chen. "Secure File System Services for Web 2.0 Applications". In: *Proceedings of the The ACM Cloud Computing Security Workshop (CCSW 2009)*. Chicago, IL, Nov. 2009.
- [39] Liang Cai, Gabriel Maganis, Hui Zang, and Hao Chen. "Mitigating DoS attacks on the paging channel by efficient encoding in page messages". In: *Proceedings of the 5th International Conference on Security and Privacy in Communication Networks (SecureComm)*. Athens, Greece, Sept. 2009.
- [40] Shaozhi Ye, Felix Wu, Raju Pandey, and Hao Chen. "Noise Injection for Search Privacy Protection". In: *Proceedings of the 2009 IEEE International Conference on Privacy, Security, Risk and Trust (PASSAT)*. Vancouver, Canada, Aug. 2009.
- [41] Liang Cai, Sridhar Machiraju, and Hao Chen. "Defending against Sensor-Sniffing Attacks on Mobile Phones". In: *The First ACM SIGCOMM Workshop on Networking, Systems, Applications on Mobile Handhelds (MobiHeld)*. Barcelona, Spain, Aug. 2009.
- [42] Justin Becker and Hao Chen. "Measuring Privacy Risk in Online Social Networks". In: *Web 2.0 Security and Privacy (W2SP)*. Oakland, CA, May 2009.
- [43] Matthew Van Gundy and Hao Chen. "Noncespaces: Using Randomization to Enforce Information Flow Tracking and Thwart Cross-Site Scripting Attacks". In: *Proceedings of the 16th Annual Network and Distributed System Security Symposium (NDSS)*. San Diego, CA, Feb. 2009.
- [44] G Mishserghi, Lihua Yuan, Zhendong Su, Chen-Nee Chuah, and Hao Chen. "A general framework for benchmarking firewall optimization techniques". In: *IEEE Transactions on Network and Service Management* 5.4 (Dec. 2008), pp. 227–238.
- [45] Steven Crites, Francis Hsu, and Hao Chen. "OMash: Enabling Secure Web Mashups via Object Abstractions". In: *Proceedings of the 15th ACM Conference on Computer and Communications Security (CCS)*. Alexandria, VA, Oct. 2008, pp. 99–107.
- [46] Yuan Niu, Francis Hsu, and Hao Chen. "iPhish: Phishing Vulnerabilities on Consumer Electronics". In: *Proceedings of Usability, Psychology, and Security 2008*. San Francisco, CA, Apr. 2008.
- [47] Sridhar Machiraju, Hao Chen, and Jean Bolot. "Distributed Authentication for Low-Cost Wireless Networks". In: *Proceedings of the Ninth Workshop on Mobile Computing Systems and Applications (HotMobile)*. Napa Valley, CA, Feb. 2008, pp. 55–59.
- [48] Radmilo Racic, Denys Ma, Hao Chen, and Xin Liu. "Exploiting Opportunistic Scheduling in Cellular Data Networks". In: *Proceedings of the 15th Annual Network and Distributed System Security Symposium (NDSS)*. San Diego, CA, Feb. 2008, pp. 333–345.
- [49] Matthew Van Gundy, Hao Chen, Zhendong Su, and Giovanni Vigna. "Feature Omission Vulnerabilities: Thwarting Signature Generation for Polymorphic Worms". In: *Proceedings of the 23rd Annual Computer Security Applications Conference (ACSAC)*. Miami Beach, FL, Dec. 2007, pp. 74–83.
- [50] Yi-Min Wang, Ming Ma, Yuan Niu, and Hao Chen. "Spam Double-Funnel: Connecting Web Spammers with Advertisers". In: *Proceedings of the 16th International World Wide Web Conference (WWW)*. Banff, Canada, May 2007.

- [51] Yuan Niu, Yi-Ming Wang, Hao Chen, Ming Ma, and Francis Hsu. "A Quantitative Study of Forum Spamming Using Context-based Analysis". In: *Proceedings of the 14th Annual Network and Distributed System Security Symposium (NDSS)*. San Diego, CA, Feb. 2007, pp. 79–92.
- [52] Francis Hsu, Hao Chen, Thomas Ristenpart, Jason Li, and Zhendong Su. "Back to the Future: A Framework for Automatic Malware Removal and System Repair". In: *Proceedings of 22rd Annual Computer Security Applications Conference (ACSAC)*. Miami Beach, FL, Dec. 2006.
- [53] Radmilo Racic, Denys Ma, and Hao Chen. "Exploiting MMS Vulnerabilities to Stealthily Exhaust Mobile Phone's Battery". In: *Proceedings of the Second IEEE Communications Society / CreateNet International Conference on Security and Privacy in Communication Network (SecureComm)*. Baltimore, MD, Aug. 2006.
- [54] Lihua Yuan, Jianning Mai, Zhendong Su, Hao Chen, Chen-Nee Chuah, and Prasant Mohapatra. "FIREMAN: A Toolkit for FIREwall Modeling and ANalysis". In: *Proceedings of 2006 IEEE Symposium on Security and Privacy*. Berkeley, CA, May 2006, pp. 199–213.
- [55] Benjamin Schwarz, Hao Chen, David Wagner, Geoff Morrison, Jacob West, Jeremy Lin, and Wei Tu. "Model Checking An Entire Linux Distribution for Security Violations". In: *Proceedings of the 2005 Annual Computer Security Applications Conference (ACSAC)*. Tucson, Arizona, Dec. 2005.
- [56] Hao Chen and Jonathan Shapiro. "Using Build-Integrated Static Checking to Preserve Correctness Invariants". In: *Proceedings of the 11th ACM Conference on Computer and Communications Security (CCS)*. Washington, DC, Nov. 2004, pp. 288–297.
- [57] Hao Chen, Drew Dean, and David Wagner. "Model Checking One Million Lines of C Code". In: *Proceedings of the 11th Annual Network and Distributed System Security Symposium (NDSS)*. San Diego, CA, Feb. 2004, pp. 171–185.
- [58] Hao Chen and David Wagner. "MOPS: an Infrastructure for Examining Security Properties of Software". In: *Proceedings of the 9th ACM Conference on Computer and Communications Security (CCS)*. Washington, DC, Nov. 2002, pp. 235–244.
- [59] Hao Chen, David Wagner, and Drew Dean. "Setuid Demystified". In: *Proceedings of the 11th USENIX Security Symposium*. San Francisco, CA, Aug. 2002, pp. 171–190.
- [60] Susan Dumais, Edward Cutrell, and Hao Chen. "Optimizing Search by Showing Results in Context". In: *Proceedings of the ACM SIGCHI Conference on Human Factors in Computing Systems (CHI)*. Seattle, WA, Apr. 2001, pp. 277–284.
- [61] Susan Dumais, Edward Cutrell, and Hao Chen. "Classified displays of web search results". In: *Proceedings of the 11th ASIST SIG/CR Classification Research Workshop*. Nov. 2000, pp. 87–90.
- [62] Susan Dumais and Hao Chen. "Hierarchical Classification of Web Content". In: *Proceedings of the 23rd ACM SIGIR Conference on Research and Development in Information Retrieval (SIGIR)*. Athens, Greece, July 2000, pp. 256–263.
- [63] Hao Chen and Susan Dumais. "Bringing Order to the Web: Automatically Categorizing Search Results". In: *Proceedings of the ACM SIGCHI Conference on Human Factors in Computing Systems (CHI)*. The Hague, The Netherlands, Apr. 2000, pp. 145–152.
- [64] Hao Chen and Tin K. Ho. "Evaluation of Decision Forests on Text Categorization". In: *Proceedings of the SPIE Conference on Document Recognition and Retrieval VII*. Vol. 3967. San Jose, CA, Jan. 2000, pp. 191–199.

- [65] Hao Chen, Jianying Hu, and Richard Sproat. "Integrating Geometrical and Linguistic Analysis for E-Mail Signature Block Parsing". In: *ACM Transactions on Information Systems* 17.4 (Oct. 1999), pp. 343–366.
- [66] Richard Sproat, Jianying Hu, and Hao Chen. "Emu: An E-mail Preprocessor for Text-to-Speech". In: *1998 Workshop on Multimedia Signal Processing*. IEEE Signal Processing Society. Redondo Beach, CA, Dec. 1998, pp. 239–244.
- [67] Hao Chen, Jianying Hu, and Richard Sproat. "E-mail Signature Block Analysis". In: *Proceedings of the 14th International Conference on Pattern Recognition (ICPR)*. Brisbane, Australia, Aug. 1998, pp. 1153–1156.
- [68] Hao Chen, Oscar E. Agazzi, and Ching Y. Suen. "Piecewise Linear Modulation Model of Handwriting". In: *Proceedings of the 4th International Conference on Document Analysis and Recognition (ICDAR)*. Ulm, Germany, Aug. 1997, pp. 363–367.

Patents

- [1] Sridhar Machiraju, Jean Bolot, and Hao Chen. "Distributed Wireless Device Association with Basestations". US 9 503 895. Nov. 22, 2016.
- [2] Sridhar Machiraju, Jean Bolot, and Hao Chen. "Distributed Wireless Device Association with Basestations". US 8 873 752. Oct. 28, 2014.
- [3] Hui Zang, Liang Cai, Hao Chen, and Gabriel Maganis. "Method for Increasing the Number of Concurrent Page Records Sent to Mobile Stations". US 8 639 275. Jan. 28, 2014.
- [4] Hui Zang, Liang Cai, Hao Chen, and Gabriel Maganis. "Method for Increasing the Number of Concurrent Page Records Sent to Mobile Stations". US 8 509 821. Aug. 13, 2013.
- [5] Sridhar Machiraju, Francis Hsu, and Hao Chen. "Cellular Authentication for Authentication to a Service". US 8 442 527. May 14, 2013.
- [6] Jianying Hu, Richard Sproeat, and Hao Chen. "E-mail Signature Block Analysis". US 6 373 985. Apr. 16, 2002.
- [7] Jianying Hu, Richard Sproeat, and Hao Chen. "E-mail Signature Block Segmentation". US 6 360 010. Mar. 19, 2002.