Hao Chen

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RESEARCH INTERESTS

Applying machine learning to security problems, including software security. Security of machine learning.

EDUCATION

University of California, Berkeley   1998-08 – 2004-06
PhD in Computer Science   *Berkeley, CA, USA*

APPOINTMENTS

Department of Computer Science, University of California   2016-07 – present
Professor   *Davis, CA, USA*

Department of Computer Science, University of California   2010-07 – 2016-06
Associate Professor   *Davis, CA, USA*

Department of Computer Science, University of California   2004-07 – 2010-06
Assistant Professor   *Davis, CA, USA*

HONORS AND AWARDS

- IEEE Fellow
- ACM Distinguished Member
- Outstanding Engineering Faculty Award, UC Davis, 2010
- CAREER Award, National Science Foundation, 2007

STUDENTS

- *Doctoral*: Liang Cai, Jiyu Chen, Jonathan Crussell, Benjamin Davis, Clint Gibler, Yifeng He, Francis Hsu, Gabriel Maganis, Yuan Niu, Yuyang Rong, Ryan Stevens, Matthew Van Gundy
- *Master*: Haitian Chen, Jeremy Erickson, Eric Gustafson, Kristen Kennedy, Denys Ma, Radmillo Racic, Jonathan Vronsky

SERVICES

Chair or co-chair of technical program committee

- IEEE Conference on Communications and Network Security (CNS) 2023
- IEEE Mobile Security Technologies (MoST) 2012, 2013

Editorial board

- Associate editor of ACM Transactions on Security and Privacy (TOPS), 2020–present

Member of program committee

- ACM Conference on Foundations of Data Science (FODS) 2020
- ACM Conference on Computer and Communications Security (CCS) 2017–2019, 2022

- IEEE Conference on Communications and Network Security (CNS) 2013–2017

- ACM Asia Conference on Computer and Communications Security (ASIACCS) 2006, 2016–2017

- IEEE Mobile Security Technologies (MoST) 2012–2017

- IEEE International Conference on Computer Communications (INFOCOM) 2016

- IEEE Symposium on Security and Privacy (S&P) 2009, 2015

- International Conference on Mobile Systems, Applications, and Services (MobiSys) 2015

- International Conference on Cryptology and Network Security (CANS) 2015

- Annual Computer Security Applications Conference (ACSAC) 2012–2013

- World Wide Web Conference (WWW) 2012

- ACM Conference on Wireless Network Security (WiSec) 2011, 2016

- Network and Distributed System Security Symposium (NDSS) 2006, 2008–2011

- International Conference on Security and Privacy in Communication Networks (SecureComm) 2007–2012

- IEEE Web 2.0 Security and Privacy (W2SP) 2009–2011, 2013

- International Conference on Distributed Computing Systems (ICDCS) 2008

- Usenix Security Symposium 2007

FUNDING

- UC Noyce Initiative, PI   2023-10 – 2025-09
  AI for Cybersecurity $1 000 000

- NSF 1956364, PI   2020-07 – 2023-06
  SaTC: CORE: Small: Collaborative: Understanding and Detecting Memory Bugs in
  Rust $199 997

- ARL CRA, PI   2018-09 – 2020-12
  MACRO: Models for Enabling Continuous Reconfigurability of Secure Missions $226 714

- NSF 1801751, PI   2018-08 – 2023-07
  SaTC: CORE: Medium: Collaborative: Towards Robust Machine Learning Systems $400 000

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

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

- NSF 1018964, PI   2010-08 – 2014-07
  Designing New Authentication Mechanisms using Hardware Capabilities in Ad-
  vanced Mobile Devices $500 000

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

- University of California MICRO, PI   2008-08 – 2009-12
  Leveraging Cellular Networks for Web Authentication $11 250

- NSF 0644450, PI   2007-07 – 2013-06
  CAREER: Securing Broadband Cellular Data Networks $400 000

- AFOSR, PI — 2007-05 – 2012-04
  Helix: A Self-Regenerative Architecture for the Incorruptible Enterprise — $1 646 000

- I3P, PI — 2005-09 – 2007-08
  Institute for Information Infrastructure Protection Fellowship — $150 000

- NSF 0524826, PI — 2005-10 – 2006-09
  CT-ISG: Reasoning about Composable Intrusion Detection Systems — $179 110

- NSF 0520320, co-PI — 2005-09 – 2008-08
  NeTS-NBD: Automatic Validation, Optimization, and Adaptation of Distributed Firewalls for Network Performance and Security — $400 000

- Sprint, PI — 2007, 2008
  Gift — $60 000

- Microsoft, PI — 2007
  Gift — $5000

- Intel, co-PI — 2005
  Gift — $150 000

PUBLICATIONS

[1] Qizhang Li, Yiwen Guo, Wangmeng Zuo, and Hao Chen. "Improving Adversarial Transferability via Intermediate-level Perturbation Decay". In: *Neural Information Processing Systems* (*NeurIPS*). New Orleans, LA, USA, Dec. 10–16, 2023.

[2] Qizhang Li, Yiwen Guo, Wangmeng Zuo, and Hao Chen. "Towards Evaluating Transfer-based Attacks Systematically, Practically, and Fairly". In: *Neural Information Processing Systems* (*NeurIPS*). New Orleans, LA, USA, Dec. 10–16, 2023.

[3] Peng Chen, Yuxuan Xie, Yunlong Lyu, Yuxiao Wang, and Hao Chen. "HOPPER: Interpretative Fuzzing for Libraries". In: *ACM Conference on Computer and Communications Security* (*CCS*). Copenhagen, Denmark, Nov. 26–30, 2023.

[4] Fangfei Lin, Bing Bai, Yiwen Guo, Hao Chen, Yazhou Ren, and Zenglin Xu. "MHCN: a Hyperbolic Neural Network Model for Multi-view Hierarchical Clustering". In: *International Conference on Computer Vision* (*ICCV*). Paris, France, Oct. 4–6, 2023.

[5] Jianyu Zhao, Yuyang Rong, Yiwen Guo, Yifeng He, and Hao Chen. "Understanding Programs by Exploiting (Fuzzing) Test Cases". In: *Findings of the Association for Computational Linguistics* (*ACL*). Toronto, Canada, July 9–14, 2023.

[6] Qizhang Li, Yiwen Guo, Wangmeng Zuo, and Hao Chen. "Making Substitute Models More Bayesian Can Enhance Transferability of Adversarial Examples". In: *International Conference on Learning Representations* (*ICLR*). Kigali, Rwanda, May 1–5, 2023.

[7] Qizhang Li, Yiwen Guo, Wangmeng Zuo, and Hao Chen. "Squeeze Training for Adversarial Robustness". In: *International Conference on Learning Representations* (*ICLR*). Kigali, Rwanda, May 1–5, 2023.

[8] Xuechao Du, Andong Chen, Boyuan He, Hao Chen, Fan Zhang, and Yan Chen. "AflIot: Fuzzing on Linux-based IoT Device with Binary-Level Instrumentation". In: *Computers & Security* (2022). ISSN: 0167-4048. DOI: https://doi.org/10.1016/j.cose.2022.102889.

[9] Yiwen Guo, Qizhang Li, Wangmeng Zuo, and Hao Chen. "An Intermediate-level Attack Framework on The Basis of Linear Regression". In: *IEEE Transactions on Pattern Analysis and Machine Intelligence* (2022). DOI: 10.1109/TPAMI.2022.3188044.

[10] Yang Liu, Zisen Xu, Ming Fan, Yu Hao, Kai Chen, Hao Chen, Yan Cai, Zijiang Yang, and Ting Liu. "ConcSpectre: Be Aware of Forthcoming Malware Hidden in Concurrent Programs". In: *IEEE Transactions on Reliability* (2022).

[11] Yuyang Rong, Chibin Zhang, Jianzhong Liu, and Hao Chen. "Valkyrie: Improving Fuzzing Performance Through Deterministic Techniques". In: *IEEE International Conference on Software Quality, Reliability, and Security (QRS)*. Guangzhou, China, Dec. 5–9, 2022. Best paper award.

[12] Jiyu Chen, Yiwen Guo, Hao Chen, and Neil Gong. "Membership Inference Attack in Face of Data Transformations". In: *IEEE Conference on Communications and Network Security (CNS)*. Austin, TX, USA, Oct. 3–5, 2022.

[13] Bulou Liu, Bing Bai, Weibang Xie, Yiwen Guo, and Hao Chen. "Task-optimized User Clustering based on Mobile App Usage for Cold-start Recommendations". In: *ACM SIGKDD Conference on Knowledge Discovery and Data Mining*. Washington DC, USA, Aug. 14–18, 2022.

[14] Yukun Jiang, Xiaoyu Cao, Hao Chen, and Neil Gong. "Feder: communication-efficient byzantine-robust federated learning". In: *ICLR Workshop on Socially Responsible Machine Learning (SRML)*. Apr. 29–29, 2022.

[15] Jiyu Chen, Yiwen Guo, Qianjun Zheng, and Hao Chen. "Protect Privacy of Deep Classification Networks by Exploiting Their Generative Power". In: *Machine Learning* 110 (2021), pp. 651–674.

[16] Yang Liu, Ming Fan, Ting Liu, Yu Hao, Zisen Xu, Kai Chen, Hao Chen, and Yan Cai. "ConcSpectre: Be Aware of Forthcoming Malware Hidden in Concurrent Programs". In: *IEEE International Conference on Software Quality, Reliability, and Security (QRS)*. Dec. 6–10, 2021. Best paper award.

[17] Ziheng Liu, Shuofei Zhu, Boqin Qin, Hao Chen, and Song Linhai. "Automatically Detecting and Fixing Concurrency Bugs in Go Software Systems". In: *International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS)*. Apr. 19–23, 2021.

[18] Weili Han, Chang Cao, Hao Chen, Dong Li, Zheran Fang, Wenyuan Xu, and Xiaoyang Wang. "senDroid: Auditing Sensor Access in Android System-Wide". In: *IEEE Transactions on Dependable and Secure Computing* 17.2 (2020), pp. 407–421.

[19] Yiwen Guo, Qizhang Li, and Hao Chen. "Backpropagating Linearly Improves Transferability of Adversarial Examples". In: *Neural Information Processing Systems (NeurIPS)*. Dec. 6–12, 2020.

[20] Qizhang Li, Yiwen Guo, and Hao Chen. "Practical No-box Adversarial Attacks against DNNs". In: *Neural Information Processing Systems (NeurIPS)*. Dec. 6–12, 2020.

[21] Haitian Chen, Bai Jiang, and Hao Chen. "StyleCAPTCHA: CAPTCHA Based on Style-Transferred Images to Defend against Deep Convolutional Networks". In: *ACM-IMS Foundations of Data Science Conference (FODS)*. Oct. 18–20, 2020.

[22] Yuyang Rong, Peng Chen, and Hao Chen. "Integrity: Finding Integer Errors by Targeted Fuzzing". In: *International Conference on Security and Privacy in Communication Networks (SecureComm)*. Oct. 21–23, 2020.

[23] Qizhang Li, Yiwen Guo, and Hao Chen. "Yet Another Intermediate-Level Attack". In: *European Conference on Computer Vision (ECCV)*. Aug. 23–28, 2020.

[24] Yunhan Jia, Yantao Lu, Junjie Shen, Qi Alfred Chen, Hao Chen, Zhenyu Zhong, and Tao Wei. "Fooling Detection Alone Is Not Enough: Adversarial Attack Against Multiple Object Tracking". In: *International Conference on Learning Representations (ICLR)*. Addis Ababa, Ethiopia, Apr. 26–30, 2020.

[25] Jiyu Chen, David Wang, and Hao Chen. "Explore the Transformation Space for Adversarial Images". In: *ACM Conference on Data and Application Security and Privacy (CODASPY)*. New Orleans, LA, USA, Mar. 16–18, 2020.

[26] Jiyu Chen, Heqing Huang, and Hao Chen. "Informer: Irregular Traffic Detection for Containerized Microservices RPC in the Real World". In: *ACM/IEEE Workshop on Security and Privacy in Edge Computing (Edge S&P)*. Washington DC, USA, Nov. 7–9, 2019.

[27] Peng Chen, Jianzhong Liu, and Hao Chen. "Matryoshka: Fuzzing Deeply Nested Branches". In: *ACM Conference on Computer and Communications Security (CCS)*. London, UK, Nov. 11–15, 2019.

[28] Chia-Cheng Yen, Dipak Ghosal, Michael Zhang, Chen-Nee Chuah, and Hao Chen. "Falsified Data Attack on Backpressure-Based Traffic Signal Control Algorithms". In: *IEEE Vehicular Networking Conference (VNC)*. Taipei, Taiwan, Dec. 5–7, 2018.

[29] Yongshuai Liu, Jiyu Chen, and Hao Chen. "Less Is More: Culling the Training Set to Improve Robustness of Deep Neural Networks". In: *Conference on Decision and Game Theory for Security (GameSec)*. Seattle, WA, USA, Oct. 29–31, 2018.

[30] Peng Chen and Hao Chen. "Angora: Efficient Fuzzing by Principled Search". In: *IEEE Symposium on Security & Privacy*. San Francisco, CA, USA, May 21–23, 2018.

[31] Yuan Zhang, Jiarun Dai, Xiaohan Zhang, Sirong Huang, Zhemin Yang, Min Yang, and Hao Chen. "Detecting Third-Party Libraries in Android Applications with High Precision and Recall". In: *IEEE International Conference on Software Analysis, Evolution, and Reengineering (SANER)*. Campobasso, Italy, Mar. 20–23, 2018.

[32] 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.

[33] 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.

[34] 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.

[35] 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.

[36] 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.

[37] 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.

[38] 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 Revocation of Android Apps". In: *ACM Asia Conference on Computer and Communications Security (ASIACCS)*. Xi'an, China, May 30–June 3, 2016.

[39] 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.

[40] 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.

[41] 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.

[42] 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.

[43] 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.

[44] 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.

[45] 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.

[46] 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.

[47] Daryl Posnett, David Kavaler, 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.

[48] 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.

[49] 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.

[50] 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.

[51] 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.

[52] 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.

[53] Matthew Van Gundy and Hao Chen. "Noncespaces: Using Randomization to Defeat Cross-Site Scripting Attacks". In: *Computers & Security* 31.4 (2012), pp. 612–628.

[54] 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.

[55] Liang Cai and Hao Chen. "On the Practicality of Motion Based Keystroke Infernce Attack". In: *5th International Conference on Trust & Trustworthy Computing* (*TRUST*). Vienna, Austria, June 13–15, 2012.

[56] 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.

[57] 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.

[58] 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.

[59] 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.

[60] 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.

[61] Francis Hsu, Hao Chen, and Sridhar Machiraju. "WebCallerID: Leveraging Cellular Networks for Web Authentication". In: *Journal of Computer Security* 19.5 (2011).

[62] Liang Cai and Hao Chen. "TouchLogger: Inferring Keystrokes on Touch Screen from Smartph One Motion". In: *6th USENIX Workshop on Hot Topics in Security* (*HotSec 11*). San Francisco, CA, Aug. 9–9, 2011.

[63] 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 17–19, 2011.

[64] 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. 6–9, 2011.

[65] 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.

[66] 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.

[67] 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. 15–19, 2010.

[68] 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. 9–13, 2009.

[69] 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. 13–13, 2009.

[70] 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. 14–18, 2009.

[71] 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. 17–17, 2009.

[72] 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. 29–31, 2009.

[73] Justin Becker and Hao Chen. "Measuring Privacy Risk in Online Social Networks". In: *Web 2.0 Security and Privacy* (*W2SP*). Oakland, CA, May 21–21, 2009.

[74] 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. 8–11, 2009.

[75] G Misherghi, 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.

[76] 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. 27–31, 2008, pp. 99–107.

[77] 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. 14–14, 2008.

[78] 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. 25–26, 2008, pp. 55–59.

[79] 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. 10–13, 2008, pp. 333–345.

[80] 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. 10–14, 2007, pp. 74–83.

[81] 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 8–12, 2007.

[82] 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. 28–Mar. 2, 2007, pp. 79–92.

[83] 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. 11–15, 2006.

[84] 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. 28–Sept. 1, 2006.

[85] Lihua Yuan, Hao Chen, Jianning Mai, Chen-Nee Chuah, Zhendong Su, and Prasant Mohapatra. "FIREMAN: a Toolkit for FIREwall Modeling and ANalysis". In: *Proceedings of 2006 IEEE Symposium on Security and Privacy*. Berkeley, CA, May 21–24, 2006, pp. 199–213.

[86] Benjamin Schwarz, Hao Chen, David Wagner Morrison, Geoff, 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. 5–9, 2005.

[87] 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. 25–29, 2004, pp. 288–297.

[88] 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. 4–6, 2004, pp. 171–185.

[89] 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. 18–22, 2002, pp. 235–244.

[90] Hao Chen, David Wagner, and Drew Dean. "Setuid Demystified". In: *Proceedings of the 11th USENIX Security Symposium*. San Francisco, CA, Aug. 5–9, 2002, pp. 171–190.

[91] 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.

[92] 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.

[93] 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.

[94] 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.

[95] 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.

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