

Bogdan Carbunar

CONTACT INFORMATION

School of Computing and Information Sciences
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EDUCATION

Ph.D. Computer Science, Purdue University 2005
Advisor: Jan Vitek, Ananth Grama and Cristina Nita-Rotaru

B.S. Computer Science, "Politehnica" University, Bucharest, Romania, 1999

EMPLOYMENT

Associate Professor: SCIS FIU, August 2017 - present

Assistant Professor: SCIS FIU, August 2011 - August 2017

Principal Staff Research Engineer: Applications Research Center, Motorola Labs, 2005 - 2011

Doctoral Research: CS Purdue, 1999 - 2005

INTERESTS

Security, privacy and distributed systems. In particular, online fraud and abuse detection and prevention, blockchain and cryptocurrencies, mobile authentication, social networks.

JOURNALS

Mizanur Rahman, Nestor Hernandez, Bogdan Carbunar, Duen Horng Chau. Towards De-Anonymization of Google Play Search Rank Fraud. In IEEE Transactions on Knowledge and Data Engineering (TKDE), 2020.

Ruben Recabarren, Bogdan Carbunar. Tithonus: A Bitcoin Based Censorship Resilient System. In Proceedings of Privacy Enhancing Technologies Symposium (PoPETS), Issue 1, Stockholm, July 2019.

Mozhgan Azimpourkivi, Umut Topkara, Bogdan Carbunar. Camera Based Two Factor Authentication Through Mobile and Wearable Devices. In Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT), Volume 1, Issue 3, 2017, and in Proceedings of the ACM International Joint Conference on Pervasive and Ubiquitous Computing (UbiComp), Maui, September 2017.

Ruben Recabarren, Bogdan Carbunar. Hardening Stratum, the Bitcoin Pool Mining Protocol. In Proceedings of Privacy Enhancing Technologies Symposium (PoPETS), Issue 3, Minneapolis, July 2017.

Rahul Potharaju, Mizanur Rahman, Bogdan Carbunar. A Longitudinal Study of Google Play. IEEE Transactions on Computational Social Systems (TCSS), Volume 4, Number 3, 2017.

Mahmudur Rahman, Mozhgan Azimpourkivi, Umut Topkara, Bogdan Carbunar. Video Liveness for Citizen Journalism: Attacks and Defenses. IEEE Transactions on Mobile Computing (TMC), Volume 16, Issue 11, November 2017.

Mahmudur Rahman, Mizanur Rahman, Bogdan Carbunar, Duen Horng (Polo) Chau. Search Rank

Fraud and Malware Detection in Google Play. *IEEE Transactions on Knowledge and Data Engineering (TKDE)*, Volume 29, Number 6, June 2017.

Mahmudur Rahman, Umut Topkara, Bogdan Carbutar. Movee: Video Liveness Verification for Mobile Devices using Built-in Motion Sensors. *IEEE Transactions on Mobile Computing (TMC)*, Volume 15, Number 5, pages 1197-1210, May 2016.

Mahmudur Rahman, Bogdan Carbutar, Umut Topkara. Secure Management of Low Power Fitness Trackers. *IEEE Transactions on Mobile Computing (TMC)*, Volume 15, Number 2, pages 447-459, February 2016.

Mingming Guo, Xinyu Jin, Niki Pissinou, Sebastian Zanlogo, Bogdan Carbutar, S.S. Iyengar. In-Network Trajectory Privacy Preservation. *ACM Computing Surveys (CSUR)*, Volume 48, Issue 2, October 2015.

Mahmudur Rahman, Bogdan Carbutar, Jaime Ballesteros, Duen Horng (Polo) Chau. To Catch a Fake: Curbing Deceptive Yelp Ratings and Venues. *Wiley Statistical Analysis and Data Mining journal (invited article)*, Volume 8, Issue 3, June 2015.

Jaime Ballesteros, Bogdan Carbutar, Mahmudur Rahman, Naphtali Rish, S.S. Iyengar. Towards Safe Cities: A Mobile and Social Networking Approach. *IEEE Transactions on Parallel and Distributed Systems (TPDS)*, Volume 25, Issue 9, 2014.

Bogdan Carbutar, Radu Sion, Moussa Ehsan, Rahul Potharaju. Private Badges for GeoSocial Networks. *IEEE Transactions on Mobile Computing (TMC)*, Volume 13, Issue 10.

Bogdan Carbutar, Mahmudur Rahman, Jaime Ballesteros, Naphtali Rish, Athanasios V. Vasilakos. ProfilR: Toward Preserving Privacy and Functionality in GeoSocial Networks. *IEEE Transactions on Information Forensics and Security (TIFS)*, Volume 9, Issue 4, 2014.

Bogdan Carbutar, Mahmudur Rahman, Niki Pissinou, Athanasios V. Vasilakos. A Survey of Privacy Vulnerabilities and Defenses in GeoSocial Networks. *IEEE Communications Magazine*, 51(11), November 2013.

Bogdan Carbutar, Rahul Potharaju, Michael Pearce, Venugopal Vasudevan, Michael Needham. A Framework for Network Aware Caching for Video on Demand Systems. *ACM Transactions on Multimedia Computing Communications and Applications (TOMCCAP)*, Volume 9, Issue 4, August 2013. **Nicolas D. Georganas Best Paper Award 2014.**

Bogdan Carbutar, Yao Chen, Radu Sion. Tipping Pennies?Privately. Practical Anonymous Micropayments. *IEEE Transactions on Information Forensics and Security (TIFS)*, Volume 7, Issue 5, October 2012.

Bogdan Carbutar, Radu Sion. Toward Private Joins on Outsourced Data. *IEEE Transactions on Knowledge and Data Engineering (TKDE)*, Volume 24, Number 9, September 2012.

Bogdan Carbutar, Mahesh Tripunitara. Payments for Outsourced Computations. *IEEE Transactions on Parallel and Distributed Systems (TPDS)*, Volume 23, Issue 2, February 2012.

Bogdan Carbutar, Radu Sion. Write Once Read Many Oblivious RAM. *IEEE Transactions on Information Forensics and Security (TIFS)*, Volume 6, Issue 4, 2011.

Bogdan Carbutar, Larry Shi, Radu Sion. Conditional E-Payments with Transferability. *Journal of Parallel and Distributed Computing (JPDC)*, Volume 71, Issue 1, January 2011.

Bogdan Carbutar, Michael Pearce, Shivajit Mohapatra, Loren Rittle, Venu Vasudevan, Octavian Carbutar. Secure Synchronization of Periodic Updates in Ad Hoc Networks. *IEEE Transactions on Parallel and Distributed Systems (TPDS)*, Volume 21, Number 8, 2010.

Bogdan Carbutar, Yang Yu, Weidong Shi, Michael Pearce, Venu Vasudevan. Query Privacy in wireless sensor networks. *ACM Transactions on Sensor Networks (TOSN)*, Volume 6, Issue 2, 2010.

Bogdan Carbutar, Ioannis Ioannidis, Cristina Nita-Rotaru. JANUS: A Framework for Scalable and Secure Routing in Hybrid Wireless Networks. *IEEE Transactions on Dependable and Secure Computing (TDSC)*, Volume 6, Number 4, 2009.

Siddharth Bhatt, Radu Sion, Bogdan Carbutar. A Personal Mobile DRM Manager for Smart-Phones. *Elsevier Computers and Security Journal*, Volume 28, Issue 6, September 2009.

Bogdan Carbutar, Murali Krishna Ramanathan, Mehmet Koyuturk, Suresh Jagannathan, Ananth Grama. Efficient Tag Detection in RFID Systems. *Journal of Parallel and Distributed Computing (JPDC)*, Volume 69, Issue 2, 2009.

Bogdan Carbutar, Ananth Grama, Jan Vitek, Octavian Carbutar. Redundancy and Coverage Detection in Sensor Networks. *ACM Transactions on Sensor Networks (TOSN)*, Volume 2, Issue 1, 2006.

Bogdan Carbutar, Marco Tulio Valente, Jan Vitek. Coordination and Mobility in CoreLime (extended version of the MA paper). *Journal of Mathematical Structures in Computer Science* 14(3), June 2004.

CONFERENCES AND WORKSHOPS Nestor Hernandez, Mizanur Rahman, Ruben Recabarren, Bogdan Carbutar. Fraud De-Anonymization For Fun and Profit. In *Proceedings of the 25th ACM Conference on Computer and Communications Security (CCS)*, Toronto, October 2018.

Mizanur Rahman, Nestor Hernandez, Bogdan Carbutar. Search Rank Fraud De-Anonymization in Online Systems. In *Proceedings of the 29th ACM Conference on Hypertext and Social Media (HT)*, Baltimore, July 2018.

Sajedul Talukder and Bogdan Carbutar. AbuSniff: Automatic Detection and Defenses Against Abusive Facebook Friends. In *Proceedings of the 12 International AAAI Conference on Web and Social Media (ICWSM)*, Stanford, June 2018.

Mozhgan Azimpourkivi, Umut Topkara, Bogdan Carbutar. A Secure Mobile Authentication Alternative to Biometrics. In *Proceedings of the ACM Annual Computer Security Applications Conference (ACSAC)*, Orlando, December 2017.

Mizanur Rahman, Ruben Recabarren, Bogdan Carbutar. Stateless Puzzles for Real Time Online Fraud Preemption. In *Proceedings of the ACM Web Science Conference (WebSci)*, Troy, NY, June 2017.

Bogdan Carbutar, Mizanur Rahman, Mozhgan Azimpourkivi, Debra Davis. GeoPal: Friend Spam Detection in Social Networks Using Private Location Proofs. In *Proceedings of the IEEE International Conference on Sensing, Communication and Networking (SECON)*, London, June 2016.

Mahmudur Rahman, Mizanur Rahman, Bogdan Carbutar, Duen Horng Chau. FairPlay: Fraud and Malware Detection in Google Play. In *Proceedings of the SIAM International Conference on Data Mining (SDM)*, Miami, May 2016.

Bogdan Carbutar, Rahul Potharaju. A Longitudinal Study of the Google App Market. In Proceedings of the IEEE/ACM International Conference on Advances in Social Networks Analysis and Mining (ASONAM), Paris, August 2015.

Mahmudur Rahman, Mozghan Azimpourkivi, Umut Topkara, Bogdan Carbutar. Liveness Verifications for Citizen Journalism Videos. In Proceedings of the 8th ACM Conference on Security and Privacy in Wireless and Mobile Networks (WiSec), New York City, June 2015.

Mahmudur Rahman, Bogdan Carbutar, Umut Topkara. Concise Paper: SensCrypt: A Secure Protocol for Managing Low Power Fitness Trackers. In Proceedings of the 22nd IEEE International Conference on Network Protocols (ICNP), Raleigh, North Carolina, October 2014.

Mahmudur Rahman, Bogdan Carbutar, Jaime Ballesteros, George Burri, Duen Horng (Polo) Chau. Turning the Tide: Curbing Deceptive Yelp Behaviors. In Proceedings of the SIAM International Conference on Data Mining (SDM), Philadelphia, April 2014. **Best student paper award.**

Mahmudur Rahman, Umut Topkara, Bogdan Carbutar. Seeing is Not Believing: Visual Verifications through Liveness Analysis using Mobile Devices. In Proceedings of the 29th Annual Computer Security Applications Conference (ACSAC), New Orleans, December 2013.

Mahmudur Rahman, Bogdan Carbutar, Madhusudan Banik. Fit and Vulnerable: Attacks and Defenses for a Health Monitoring Device. In the 6th Workshop on Hot Topics in Privacy Enhancing Technologies (HotPETs), Bloomington, July 2013.

Jaime Ballesteros, Bogdan Carbutar, Mahmudur Rahman, Naphtali Rische. Yelp Events. Making Bricks Without Clay? Proceedings of the 5th International Workshop on Hot Topics in Peer-to-peer Computing and Online Social Networking (IEEE HotPOST@ICDCS), Philadelphia, July 2013. **Best paper award.**

Tao Feng, Ziyi Liu, Bogdan Carbutar, Dainis Bumber, Weidong Shi. Continuous Remote Mobile Identity Management Using Biometric Integrated Touch-Display. In Proceedings of the IEEE Micro Workshop on Hardware and Architectural Support for Security and Privacy (HASP), Vancouver, December 2012.

Bogdan Carbutar, Mahmudur Rahman, Jaime Ballesteros, Naphtali Rische. Private Location Centric Profiles for GeoSocial Networks. In Proceedings of the 20th ACM SIGSPATIAL International Conference on Advances in Geographic Information Systems (GIS), Redondo Beach, CA, November 2012 (short paper).

Tao Feng, Ziyi Liu, Kyeong-An Kwon, Weidong Shi, Bogdan Carbutar, Yifei Jiang, Nhung Nguyen. Continuous Mobile Authentication using Touchscreen Gestures. In Proceedings of the 12th IEEE Conference on Technologies for Homeland Security (HST), Waltham, MA, November 2012.

Bogdan Carbutar, Rahul Potharaju. You unlocked the Mt. Everest Badge on Foursquare! Countering Location Fraud in GeoSocial Networks. In Proceedings of the 9th IEEE International Conference on Mobile Ad hoc and Sensor Systems (MASS), Las Vegas, October 2012.

Jaime Ballesteros, Mahmudur Rahman, Bogdan Carbutar, Naphtali Rische. Safe Cities. A Participatory Sensing Approach. In Proceedings of the 37th IEEE Conference on Local Computer Networks (LCN), Orlando, October 2012.

Bogdan Carbutar, Radu Sion, Rahul Potharaju, Moussa Ehsan. The Shy Mayor: Private Badges in Geosocial Networks. In Proceedings of the 10th International Conference on Applied Cryptography and Network Security (ACNS), Singapore, June 2012.

Bogdan Carbunar, Rahul Potharaju, Michael Pearce, Venu Vasudevan. Network Aware Caching for Video on Demand Systems. In Proceedings of the 13th IEEE International Symposium on a World of Wireless, Mobile and Multimedia (IEEE WOWMOM), San Francisco, June 2012.

Bogdan Carbunar, Michael Pearce, Venu Vasudevan, Michael Needham. Predictive Caching for Video on Demand CDNs. In Proceedings of the 54th IEEE Global Communications conference (GLOBECOM), Houston, December 2011.

Bogdan Carbunar, Radu Sion. Private Geosocial Networks. In Proceedings of the 19th ACM SIGSPATIAL International Conference on Advances in Geographic Information Systems (ACM SIGSPATIAL GIS), Chicago, November 2011.

Martin Franz, Bogdan Carbunar, Stefan Katzenbeisser, Radu Sion. Oblivious Outsourced Storage with Delegation. In Proceedings of the 15th International Conference on Financial Cryptography and Data Security (FC), St. Lucia, March 2011.

Bogdan Carbunar, Radu Sion. Joining Privately on Outsourced Data. In Proceedings of the 7th VLDB Secure Data Management Workshop (SDM), Singapore, September 2010.

Bogdan Carbunar, Radu Sion. Regulatory Compliant Oblivious RAM. In Proceedings of the 8th International Conference on Applied Cryptography and Network Security (ACNS), Beijing, June 2010.

Bogdan Carbunar, Mahesh Tripunitara. Fair Payments for Outsourced Computations. In Proceedings of the 7th IEEE International Conference on Sensor, Mesh and Ad Hoc Communications and Networks (SECON), Boston, June 2010.

Yao Chen, Radu Sion, Bogdan Carbunar. XPay: Practical Anonymous Payments for TOR Routing and Other Networked Services. In Proceedings of the 8th ACM Workshop on Privacy in the Electronic Society (WPES), Chicago, November 2009.

Mahesh Tripunitara, Bogdan Carbunar. Efficient Access Enforcement in Distributed Role-Based Access Control (RBAC) Deployments. In Proceedings of the 14th ACM Symposium on Access Control Models and Technologies (SACMAT), Stresa, June 2009.

Bogdan Carbunar, Mahesh Tripunitara. Conditional Payments for Computing Markets. In Proceedings of the 7th International Conference on Cryptology and Network Security (CANS), Hong Kong, December 2008.

Peter Williams, Radu Sion, Bogdan Carbunar. Building Castles out of Mud: Practical Access Pattern Privacy and Correctness on Untrusted Storage. In Proceedings of the ACM Conference on Computer and Communication Security (CCS), Alexandria, October 2008.

Bogdan Carbunar, Michael Pearce, Shivajit Mohapatra, Loren J. Rittle, Venu Vasudevan. Byzantine Resilient Synchronization for Content and Presence Updates in MANETS. In Proceedings of the 16th IEEE International Conference on Network Protocols (ICNP), Orlando, October 2008.

Shivajit Mohapatra, Bogdan Carbunar, Michael Pearce, Rohit Chaudhri, Venu Vasudevan. Where-Fi: A Dynamic Energy-Efficient Multimedia Distribution Framework for MANETs. In Proceedings of the 15th SPIE/ACM Multimedia Computing and Networking (MMCN), San Jose, January 2008.

Bogdan Carbunar, Yang Yu, Larry Shi, Michael Pearce, Venu Vasudevan. Query Privacy in Wireless Sensor Networks. In Proceedings of the 4th IEEE International Conference on Sensor and Ad Hoc Communications and Networks (SECON), San Diego, June 2007.

Bogdan Carbunar, Brett Lindsley, Michael Pearce, Venu Vasudevan. Verifiable Credit Based Transfers in Wireless Ad Hoc Networks. In Proceedings of the 21st IEEE International Parallel and Distributed Processing Symposium (IPDPS), Long Beach, March 2007.

Larry Shi, Bogdan Carbunar, Radu Sion. Conditional E-Cash. In Proceedings of the 11th Financial Cryptography and Data Security Conference (FC), Tobago, February 2007.

Radu Sion, Bogdan Carbunar. On the Computational Practicality of Private Information Retrieval. In Proceedings of the 14th ISOC Network and Distributed System Security Symposium (NDSS), San Diego, February 2007.

Bogdan Carbunar, Radu Sion. Uncheatable Reputation in Distributed Computation Markets. In Proceedings of the 10th Financial Cryptography and Data Security Conference (FC), Anguilla, 2006.

Bogdan Carbunar, Murali Krishna Ramanathan, Mehmet Koyuturk, Christoph Hoffmann, Ananth Grama. Redundant Reader Elimination in RFID Systems. In Proceedings of the 2nd IEEE International Conference on Sensor and Ad Hoc Communications and Networks (SECON), Santa Clara, September 2005.

Ioannis Ioannidis, Bogdan Carbunar, Cristina Nita-Rotaru. High Throughput Routing in Hybrid Cellular and Ad-Hoc Networks. In Proceedings of the 6th International Symposium on World of Wireless and Mobile Multimedia (IEEE WOWMOM), Taormina, June, 2005.

Bogdan Carbunar, Ananth Grama, Jan Vitek, Octavian Carbunar. Coverage Preserving Redundancy Elimination in Sensor Networks. In Proceedings of the 1st IEEE International Conference on Sensor and Ad Hoc Communications and Networks (SECON), Santa Clara, October 2004.

Bogdan Carbunar, Ioannis Ioannidis, Cristina Nita-Rotaru. JANUS: Towards Secure and Malicious Resilient Routing in Hybrid Cellular and Ad-Hoc Networks. In Proceedings of the 3rd Workshop on Wireless Security (WiSe), Philadelphia, October 2004.

BOOK AND BOOK CHAPTER

Rahul Potharaju, Bogdan Carbunar, Mozghan Azimpourkivi, Venugopal Vasudevan, S.S. Iyengar. Infiltrating Social Network Accounts: Attacks and Defenses. Book chapter in Springer's Secure System Design and Trustable Computing, C.-H. Chang and M. Potkonjak (eds.), 2015.

Bogdan Carbunar, Murali Krishna Ramanathan, Mehment Koyuturk, Suresh Jagannathan, Ananth Grama. Optimal Tag Coverage and Tag Report Elimination. Book chapter in Wiley's RFID Systems: Research Trends and Challenges, editors M. Bolic, D. Simplot-Ryl, I. Stojmenovic.

Bogdan Carbunar. Coverage Problems in Wireless Sensor and RFID Systems. VDM Verlag Dr. Muller. ISBN 978-3-639-12156-8.

PATENTS

Bogdan Carbunar, Michael Pearce, Venugopal Vasudevan, Loren J. Rittle, Michael Needham. Caching Content. US 9,154,811. Issued on October 2015.

Bogdan Carbunar, Shivajit Mohapatra, Michael Pearce, Loren J. Rittle, Venugopal Vasudevan. Method for Synchronizing Transmission Times in Ad Hoc Networks using Packet Reception Time Statistics. US 8,073,014. Issued on December 2011.

George Calcev, Bogdan Carbunar, Madjid Nakhjiri. Method and Apparatus for Dynamic Seamless Security in Communication Protocols. US7865717 B2. Issued on February 2011.

Bogdan Carbunar, Yang Yu, Larry Shi, Michael Pearce. Method and Apparatus for Performing

Anonymous Source Routing. US7532587 B2. Issued May 2009.

Yang Yu, Bogdan Carbunar, Zhu Li, Larry Shi. Method And Apparatus For User Recognition Employing Motion Passwords. WO/2009/155254.

Brett Lindsley, Bogdan Carbunar, Mark Clayton, Venu Vasudevan. Method And System For Distributing Content In An Ad-Hoc P2P Environment Using Super-Peers. WO 2008048789 20080424.

TEACHING

CEN5079 - Secure Applications Programming: Spring 2019, Fall 2018, Spring 2018, Fall 2017, Spring 2017

CIS5370 - Principles of Cybersecurity: Fall 2016

CIS5372 - Foundations of Computer Security: Fall 2015, Fall 2014, Spring 2013, Fall 2012, Fall 2011

CIS5372 - Foundations of Computer Security (online): Fall 2012

CIS5373 - Systems Security: Spring 2020, Spring 2016, Spring 2014

CIS5374 - Information Security and Privacy: Fall 2017, Fall 2016, Fall 2015, Fall 2014, Fall 2013, Spring 2012

CNT 4403 - Computer Security: Spring 2015, Fall 2012

SERVICE

ACM WiSec 2020, PoPETS 2020, ACM CCSW 2019, PoPETS 2019, ICISS 2019, ACM Web (former WWW) 2019, ACM AsiaCCS 2018, IEEE ICNC 2018, CANS 2017, IEEE LCN 2017, ACM AsiaCCS 2017, IEEE ICNC 2017, IoTPTS 2017, IEEE LCN 2016, HotPOST 2016, IoTPTS 2016, WESS 2015, IEEE CloudCom 2015, NSS 2015, IEEE LCN 2015, ISC 2014, WESS 2014, ICCVE 2014, IEEE LCN 2014 (Publicity Chair), INSCRYPT 2013, CANS 2013, ICICS 2013, IEEE ICDCS 2013, IEEE CCNC 2013, WESS 2013, Inscrypt 2012, IEEE ICPADS 2012, IEEE SICK, ISOC NDSS 2012, CCSocialComp 2011, ACM STC 2011, IEEE ICME 2011, ACM CCSW 2010, ACM STC 2010, ACM SAC 2010, FC 2010, CoSec 2009, ACM STC 2009, ACM CCSW 2009, IEEE NPSec 2009, IEEE NPSec 2008, FC 2008 (Poster Chair), MODUS 2008, IEEE NPSec 2007, Inscrypt 2007