

Bogdan Carbunar

CONTACT INFORMATION

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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

RESEARCH EXPERIENCE

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

RESEARCH INTERESTS

Security and privacy with applications in online and geosocial networks, data and computation outsourcing, wireless networks, mobile applications

PUBLICATIONS

BOOK AND BOOK CHAPTER

Rahul Potharaju, Bogdan Carbunar, Mozhgan 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.

JOURNALS

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. Accepted in the IEEE Transactions on Mobile Computing (TMC), 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 Carbunar. 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 Rishé, 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 Rishé, 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 Smartphones. *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.

HYBRID JOURNAL AND CONFERENCE Mozghan Azimpourkivi, Umut Topkara, Bogdan Carbutar. Camera Based Two Factor Authentication Through Mobile and Wearable Devices. Accepted in the ACM International Joint Conference on Pervasive and Ubiquitous Computing (UbiComp), Maui, HI, September 2017. To appear in *Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT)*, Volume 1, Issue 3, 2017.

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

CONFERENCES AND WORKSHOPS Mozghan Azimpourkivi, Umut Topkara, Bogdan Carbutar. A Secure Mobile Authentication Alternative to Biometrics. Accepted in 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, Mozghan Azimpourkivi, Debra Davis. GeoPal: Friend Spam Detection in Social Networks Using Private Location Proofs. Accepted in the IEEE International Conference on Sensing, Communication and Networking (SECON) [acceptance rate=26%], London, June 2016.

Mahmudur Rahman, Mizanur Rahman, Bogdan Carbutar, Duen Horng Chau. FairPlay: Fraud and Malware Detection in Google Play. Accepted in 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)* [acceptance rate=18%], 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)* [acceptance rate=19%], 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) [acceptance rate=18.99%], 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. [acceptance rate=15.4%] **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) [acceptance rate=19%], 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)[acceptance rate=29%], 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) [acceptance rate=17.1%], Singapore, June 2012.

Bogdan Carbutar, 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) [acceptance rate=22%], San Francisco, June 2012.

Bogdan Carbutar, 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 Carbutar, 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 Carbutar, Stefan Katzenbeisser, Radu Sion. Oblivious Outsourced Storage with Delegation. In Proceedings of the 15th International Conference on Financial Cryptography and Data Security (FC) [full paper acceptance rate=20%], St. Lucia, March 2011.

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

Bogdan Carbutar, Radu Sion. Regulatory Compliant Oblivious RAM. In Proceedings of the 8th International Conference on Applied Cryptography and Network Security (ACNS) [acceptance rate=18.5%], Beijing, June 2010.

Bogdan Carbutar, 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) [acceptance rate=21%], Boston, June 2010.

Yao Chen, Radu Sion, Bogdan Carbutar. 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 Carbutar. 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 Carbutar, 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 Carbutar. 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) [acceptance rate=15%], Alexandria, October 2008.

Bogdan Carbutar, 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) [acceptance rate=16%], Orlando, October 2008.

Shivajit Mohapatra, Bogdan Carbutar, 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) [acceptance rate=26%], San Jose, January 2008.

Bogdan Carbutar, 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) [acceptance rate=20%], 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) [acceptance rate=26%], 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) [acceptance rate=18%], 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) [acceptance rate=15%], 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) [acceptance rate=29%], 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) [acceptance rate=27%], 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) [acceptance rate=18%], 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), held in conjunction with Mobicom [acceptance rate=25%], Philadelphia, October 2004.

Bogdan Carbunar, Ioannis Ioannidis, Ananth Grama, Jan Vitek. A Secure Crediting Protocol for Hybrid Cellular and Ad Hoc Networks. In Proceedings of the 1st International Conference on E-Business and Telecommunication Networks (ICETE), Setubal, August 2004.

Bogdan Carbunar, Ananth Grama, Jan Vitek. Distributed and Dynamic Voronoi Overlay Maintenance for Coverage Detection and Distributed Hash Tables in Ad Hoc Networks. In Proceedings of the 10th IEEE International Conference on Parallel and Distributed Systems (ICPADS), Long Beach, July 2004.

Bogdan Carbunar, Nitya Narasimhan, Venu Vasudevan. Boundary Tracking Solutions for Mobile Ad Hoc Networks. In Proceedings of Parallel and Distributed Computing and Systems (PDCS), Cambridge, November 4-6, 2002

Bogdan Carbunar, Marco Tulio Valente, Jan Vitek. Lime Revisited: Reverse Engineering An Agent Communication Model. In Proceedings of the 5th International Conference on Mobile Agents (MA2001), Atlanta, December 2-4, 2001

Bogdan Carbunar, Marco Valente, Jan Vitek. CoreLime: A Coordination Model for Mobile Agents.

In Proceedings of ConCoord: Workshop on Concurrency and Coordination, Lipari, July 6-8, 2001

POSTERS, DEMOS

Paras Jain, Shang-Tse Chen, Mozhgan Azimpourkivi, Duen Horng Chau, Bogdan Carbunar. Spotting Suspicious Reviews via (Quasi-)Clique Extraction. IEEE Security and Privacy, 2015 (poster).

Mahmudur Rahman, Jaime Ballesteros, Bogdan Carbunar, Naphtali Rishe, Athanasios V. Vasilakos. Toward Preserving Privacy and Functionality in GeoSocial Networks. In Proceedings of the ACM Mobicom, 2013 (poster paper).

Bogdan Carbunar, Mahmudur Rahman, Jaime Ballesteros, Naphtali Rishe. Eat the Cake and Have it Too: Privacy Preserving Location Aggregates in GeoSocial Networks. IEEE Security and Privacy, 2012 (poster).

Mahmudur Rahman, Bogdan Carbunar, Madhusudan Banik. Fit and Vulnerable: Attacks and Defenses for a Health Monitoring Device. IEEE Security and Privacy, 2012 (poster).

Yao Chen, Radu Sion, Bogdan Carbunar. Anonymity and Privacy for Micropayments. In Proceedings of the 17th Usenix Security Symposium, San Jose, July 2008 (poster paper).

Radu Sion, Sumeet Bajaj, Bogdan Carbunar, Stefan Katzenbeisser. NS2: Networked Searchable Store with Correctness. In Proceedings of the 33rd International Conference on Very Large Data Bases (VLDB), Viena, September 2007 (demo paper).

Siddharth Bhatt, Bogdan Carbunar, Radu Sion, Venu Vasudevan. Personal Digital Rights Management for Mobile Cellular Devices. Systems paper in the 11th Financial Cryptography and Data Security Conference (FC) [acceptance rate=18%], Tobago, February 2007.

Radu Sion, Bogdan Carbunar. Mechanisms for Secure Reputation. Work in progress talk at the IEEE Symposium on Security and Privacy (SP), Oakland, May 2005.

Bogdan Carbunar, Ananth Grama, Jan Vitek. A Public Key Algorithm for Ad Hoc Networks (extended abstract/poster). In Proceedings of the 23rd IEEE International Performance Computing and Communications Conference, Phoenix, April 15-17, 2004.

Ioannis Ioannidis, Bogdan Carbunar. Scalable Routing in Hybrid Ad-Hoc and Cellular Networks (poster). In Proceedings of the 1st IEEE International Conference on Mobile Ad Hoc and Sensor Systems (MASS), Fort Lauderdale, October 2004.

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.