

Indrakshi Ray

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Career Highlights

Education Ph.D. in Information Technology, George Mason University, 1997.

Research Interests Cyber Security, Software Assurance, Cyber Physical Systems Security, Data Analytics

Current Position

Professor, Computer Science Department, Colorado State University
Director, Colorado Center for Cybersecurity
Site Director, NSF IUCRC Center for Cybersecurity Analytics and Automation Phase II
Adjunct Professor, Electrical and Computer Engineering, Colorado State University
Adjunct Professor, Systems Engineering, Colorado State University

Research Impact

Publications: 50 (Journals), 143 (Conferences), 39 (Workshops), 9 (Book chapters)
Google scholar statistics: 42 (h-index), 132 (i-10 index), 6852 (citations)

Mentoring and Collaboration

Graduated Advisees and Co-advisees: 18 (Ph.D.), 22 (M.S.), 32 (B.S.)
Current Advisees and Co-advisees: 7 (Ph.D.), 7 (M.S.), 7 (B.S.)
Collaborators count: 213 (DBLP)

Research Grants

Grants: 32 (PI), 13 (Co-PI)
Funding agencies: 13
Total grants: 7M

Awards including Students Awards

Professor Laureate, College of Natural Sciences, Colorado State University, 2021.
Honorary Mention Award, European Symposium on Usable Security (EuroUSEC), 2021. (with Lorenzo De Carli and Erin Solovey)
Best Paper Finalist Award, IEEE Conference on Local Computer Networks (LCN), 2020. (with Hossein Shirazi, Shashika Muramudalige, Anura Jayasumana)
1st Place, Graduate Student Research Competition, Richard Tapia Celebration of Diversity Conference (Tapia), 2019. (Hajar Homayouni)
Best Student Paper Award, IFIP WG 11.3 Conf. on Data and Applications Security and Privacy (DBSec), 2019. (with Hossein Shirazi, Bruhadeshwar Bezawada, Charles Anderson)
Western Association of Graduate School (WAGS)/ProQuest Distinguished Master's Thesis Award, 2019. (Hajar Homayouni)

Most Influential Theme Section Paper Award, Software and System Modeling (SoSym) Journal, 2016. (with Kyriakos Anastasakis, Behzad Bordbar, Geri Georg)

Best Student Paper Award, Intl. Conf. on Security and Cryptography (SECRYPT), 2016. (with Kirill Belyaev)

Best Paper Award, Intl. Conf. on Engr. of Complex Systems (ICECCS), 2002. (with Robert France, Geri Georg)

Diversity and Outreach

Founding Faculty Member ACM-W Colorado State University

Founding Faculty Member Women in Cybersecurity Colorado State University

Curriculum Vitae Details

Education

1997 Ph.D., School of Information Technology, George Mason University, Fairfax, Virginia.

1991 Master of Computer Science and Engineering, Jadavpur University, Calcutta, India.

1988 Bachelor of Engineering, Indian Institute of Engineering Science and Technology Shibpur, Howrah, India.

Dissertation

Using Formal Methods in Semantics-Based Decomposition of Transactions

Ph.D. Advisors

Professor Sushil Jajodia and Professor Paul Ammann

Research Interests

Cyber Security, Software Assurance, Cyber Physical Systems Security, Data Analytics

Positions

August 2023 – present, Director, Colorado Center for Cybersecurity, Colorado State University System.

October 2018 – present, Director, Colorado Center for Cybersecurity.

February 2017 – present, Site Director, NSF IUCRC Center for Cybersecurity Analytics and Automation Phase II.

July 2014 – present, Professor, Computer Science Department, Colorado State University.

July 2006 – June 2014, Associate Professor, Computer Science Department, Colorado State University.

June 2014 – August 2014, Senior Summer Faculty Fellow, Naval Research Laboratory.

June 2013 – August 2013, Senior Summer Faculty Fellow, Naval Research Laboratory.

June 2012 – July 2012, Visiting Faculty, Air Force Research Laboratory.

September 2009 – February 2010, Visiting Professor, INRIA Rocquencourt, France.

August 2001 – June 2006, Assistant Professor, Computer Science Department, Colorado State University.

May 2002 – August 2002, Visiting Faculty, Air Force Research Laboratory.

August 1997 – July 2001, Assistant Professor, Computer and Information Science Department, University of Michigan-Dearborn.

August 1993 – July 1997, Research Assistant, Information and Software Engineering Department, George Mason University.

Honors and Awards (including Student Awards)

Professor Laureate, College of Natural Sciences, Colorado State University, 2021.

Vision: Stewardship of Smart Devices Security for the Aging Population, EuroUSEC, 2021, Honorary Mention Paper Award.

Improved Phishing Detection Algorithms using Adversarial Autoencoder Synthesized Data, LCN 2020, Best Paper Finalist Award.

ADQuaTe: An Automated Interactive Data Quality Test Approach, Tapia 2019, 1st Place Graduate ACM Student Research Competition. (Student: Hajar Homayouni)

Adversarial Sampling Attacks against Phishing Detection, DBSec 2019, Best Student Paper Award. (Student: Hossein Shirazi)

Western Association of Graduate School (WAGS)/ProQuest Distinguished Master's Thesis Award, 2019. (Student: Hajar Homayouni)

On Challenges of Model Transformation from UML to Alloy, Software and System Modeling 9(1):69-86 2010. Most Influential Theme Section Paper Award 2016.

Towards Access Control for Isolated Applications, SECRIPT 2016, Best Student Paper Award. (Student: Kirill Belyaev)

Using Aspects to Design a Secure System, ICECCS 2002, Best Paper Award.

George Mason University Fellowship Award, George Mason University, 1996-1997.

National Scholar, Govt. of India, 1982.

Refereed Journal Publications

1. Paul Ammann, Sushil Jajodia and Indrakshi Ray “Applying Formal Methods to Semantic-Based Decomposition of Transactions”, *ACM Transactions on Database Systems*, Vol 22(2), June 1997, pages 215–254.
2. Indrakshi Ray, Paul Ammann and Sushil Jajodia “A Semantic Model for Multilevel Transactions”, *Journal of Computer Security*, Vol 6(3), 1998, pages 181–217.
3. Indrakshi Ray, Paul Ammann and Sushil Jajodia, “Using Semantic Correctness in Multidatabases to Achieve Local Autonomy, Distribute Coordination, and Maintain Global Integrity”, *Information Sciences*, Vol 129(1-4), November 2000, pages 155–195.
4. Indrakshi Ray, “Real-Time Update of Access Control Policies”, *Data and Knowledge Engineering*, 49(3), June 2004, pages 287–309.
5. Indrakshi Ray, Robert France, Na Li and Geri Georg, “An Aspect-Based Approach to Modeling Access Control Concerns”, *Information and Software Technology*, 46(9), July 2004, pages 557-633.
6. Robert France, Indrakshi Ray, Geri Georg and Sudipto Ghosh, “An Aspect-Oriented Approach to Design Modeling”, *IEE Proceedings – Software, Special Issue on Early Aspects: Aspect-Oriented Requirements Engineering and Architecture Design*, 151(4), August 2004, pages 173–185.
7. Indrajit Ray, Indrakshi Ray and Narasimhamurthi Natarajan, “An Anonymous and Failure Resilient Fair-Exchange E-Commerce Protocol using Off-line Third Parties”, *Decision Support Systems*, 39(5), May 2005, pages 267–292.
8. Indrakshi Ray, “Applying Semantic Knowledge to Real Time Update of Access Control Policies”, *IEEE Transactions on Knowledge and Data Engineering*, 17(6), June 2005, pages 844-858.
9. Indrakshi Ray and Mahendra Kumar, “Towards a Location-Based Mandatory Access Control Model”, *Computers and Security*, 25(1), February 2006, pages 36-44.
10. Anna Cinzia Squicciarini, Elisa Bertino, Elena Ferrari, and Indrakshi Ray “Achieving Privacy with an Ontology-Based Approach in Trust Negotiations”, *IEEE Transactions on Dependable and Secure Computing*, 3(1), January - March 2006, pages 13 -30.
11. Indrakshi Ray and Tai Xin, “Analysis of Dependencies for Advanced Transactions”, *Distributed and Parallel Databases*, 20(1), July 2006, pages 5-27.
12. Eunjee Song, Shuxin Yin and Indrakshi Ray, “Using UML to Model Relational Database Operations”, *Computer Standards and Interfaces*, 29(3), March 2007, pages 343-354.
13. Tai Xin and Indrakshi Ray, “A Lattice-Based Approach for Updating Access Control Policies in Real-Time”, *Information Systems*, 32(5), July 2007, pages 755-772.
14. Indrakshi Ray, Indrajit Ray and Sudip Chakraborty, “An Interoperable Context-Sensitive Model of Trust”, *Journal of Intelligent Information Systems*, 32(1), February 2009, pages 75-104.
15. Nayot Poolsappasit and Indrakshi Ray, “Towards Achieving Personalized Privacy for Location-Based Services”, *Transactions on Data Privacy – Special Issue on Security and Privacy in GIS and LBS*, 2(1), 2009, pages 77-99.
16. Geri Georg, Indrakshi Ray, Kyriakos Anastasakis, Behzad Bordbar, Manachai Toahchoodee and Siv Hilde Houmb, “An Aspect-Oriented Methodology for Designing Secure Applications”, *Information and Software Technology – Special Issue on Model Based Development for Secure Information Systems*, 51(5), May 2009, pages 846-864.
17. Manachai Toahchoodee and Indrakshi Ray, “Using Alloy to Analyze a Spatio-Temporal Access Control Model Supporting Delegation”, *IET Information Security*, 3(3), September 2009, pages 75-127.
18. Kyriakos Anastasakis, Behzad Bordbar, Geri Georg and Indrakshi Ray, “On Challenges of Model Transformation from UML to Alloy”, *Software and Systems Modeling*, [Winner of Most Influential Theme Section Paper Award](#) 9(1), January 2010, pages 69-86.
19. Geri Georg, Kyriakos Anastasakis, Behzad Bordbar, Siv Hilde Houmb, Indrakshi Ray and Manachai Toahchoodee, “Verification and Trade-off Analysis of Security Properties in UML System Models”, *IEEE Transactions on Software Engineering*, 36(3), May-June 2010, pages 338-356.

20. Rinku Dewri, Indrakshi Ray, Indrajit Ray and Darrell Whitley, "Real Time Stochastic Scheduling in Broadcast Systems with Decentralized Data Storage", *Real-Time Systems*, 45(3), August 2010, pages 143-175.
21. Manachai Toahchoodee, Indrakshi Ray, and Ross McConnell, "Using Graph Theory to Formalize a Spatio-Temporal Role-Based Access Control Model", *International Journal of Next Generation Computing*, 1(2), November 2010.
22. Tristan Allard, Nicolas Anciaux, Luc Bougamin, Yanli Guo, Lionel Le Folgoc, Benjamin Nguyen, Philippe Pucheral, Indrajit Ray, Indrakshi Ray and Shaoyi Yin, "Secure Personal Data Servers: A Vision Paper", *Proceedings of the VLDB Endowment*, 3(1), September 2010, pages 25-35.
23. Manachai Toahchoodee and Indrakshi Ray, "On the Formalization and Analysis of a Spatio-Temporal Role-Based Access Control Model", *Journal of Computer Security*, 19(3), 2011, pages 399-452.
24. Parvathi Chundi, Tai Xin, and Indrakshi Ray, "When Does a Workflow Complete?", *Computer Standards and Interfaces*, 33(3), March 2011, pages 292-300.
25. Rinku Dewri, Indrakshi Ray, Indrajit Ray and Darrell Whitley, "k-Anonymization in the Presence of Publisher Preferences", *IEEE Transactions on Knowledge and Data Engineering*, 23(11), November 2011, pages 1678-1690.
26. Rinku Dewri, Indrajit Ray, Indrakshi Ray and Darrell Whitley, "Exploring Privacy versus Data Utility Tradeoffs in Anonymization Techniques using Multi-objective Optimization", *Journal of Computer Security*, 19(5), 2011, pages 935-974.
27. Rinku Dewri, Indrajit Ray, Indrakshi Ray and Darrell Whitley, "Utility Driven Optimization of Real Time Data Broadcast Schedules", *Applied Soft Computing*, 12(7), July 2012, pages 1832-1846.
28. Raman Adaikkalavan, Xing Xie, and Indrakshi Ray, "Multilevel Secure Data Stream Processing: Architecture and Implementation", *Journal of Computer Security*, 20(5), 2012, pages 547-581.
29. Ramadan Abdunabi, Mustafa Al-Lail, Indrakshi Ray, and Robert France, "Specification and Validation of a Generalized Spatio-Temporal Role-Based Access Control Model", *IEEE Systems Journal*, 7(3), 2013, pages 501-515.
30. Ramadan Abdunabi, Wuliang Sun, and Indrakshi Ray, "Enforcing Spatio-Temporal Access Control for Mobile Applications", *Computing*, 96(4), 2014, pages 313-353.
31. Ping Yang, Xing Xie, Indrakshi Ray, and Shiyong Lu, "Satisfiability Analysis of Workflows with Control-Flow Patterns and Authorization Constraints", *IEEE Transactions on Services Computing*, 7(2), 2014, pages 237-251.
32. Wuliang Sun, Benoît Combemale, Robert B. France, Arnaud Blouin, Benoit Baudry, and Indrakshi Ray, "Using Slicing to Improve the Performance of Model Invariant Checking", *Journal of Object Technology*, 14(4), 2015, pages 1-28.
33. Constance Heitmeyer, Marc Pickett, Elizabeth Leonard, Myla Archer, Indrakshi Ray, David Aha, and Gregory Trafton, "Building High Assurance Human-Centric Decision Systems", *Automated Software Engineering*, 22(2), 2015, pages 159-197.
34. Jeremy Daily, Rose Gamble, Stephen Moffitt, Connor Raines, Paul Harris, Jannah Miran, Indrakshi Ray, Subhojeet Mukherjee, Hossein Shirazi, and James Johnson, "Towards a Cyber Assurance Testbed for Heavy Vehicle Electronic Controls", *SAE International Journal of Commercial Vehicles*, 9(2):339-349, 2016.
35. Kirill Belyaev and Indrakshi Ray, "On the Formalization, Design, and Implementation of Component-Oriented Access Control in Lightweight Virtualized Server Environments", *Computers and Security* 71:15-35, 2017.
36. Hossein Shirazi, Kyle Haefner, and Indrakshi Ray, "Improving Auto-Detection of Phishing Websites using Fresh-Phish Framework", *International Journal of Multimedia Data Engineering and Management*, 9(8):51-64, 2018.
37. Kirill Belyaev, Wuliang Sun, Indrakshi Ray, and Indrajit Ray, "On the Design and Analysis of Protocols for Personal Health Record Storage on Personal Data Server Devices", *Future Generation Computer Systems*, 80:467-482, 2018.
38. Tarik Moataz, Indrajit Ray, Abdullatif Shifka, Indrakshi Ray, Frederic Cuppens, and Nora Coppens, "Substring Search over Encrypted Data", *Journal of Computer Security*, 26(1):1-30, 2018.

39. Kirill Belyaev and Indrakshi Ray, “Component-Oriented Access Control – Application Servers Meet Tuple Spaces for the Masses”, *Future Generation Computer Systems*, 86:726-739, 2018.
40. Subhojeet Mukherjee, Jeffrey C. Van Ete, Namburi Rani Samyukta, Jacob Walker, Indrakshi Ray, and Indrajit Ray, “TruckSTM: Runtime Realization of Operational State Transitions for Medium and Heavy Duty Vehicles”, *ACM Transactions on Cyber-Physical Systems*, 4(1):1-25, 2020.
41. Diptendu Kar, Indrajit Ray, Jena Gallegos, Jean Peccoud, and Indrakshi Ray, “Synthesizing DNA molecules with Identity-Based Digital Signatures to Prevent Malicious Tampering and Enabling Source Attribution”, *Journal of Computer Security*, 28(4): 437-467, 2020.
42. Bruhadeshwar Bezawada, Indrakshi Ray, and Indrajit Ray, “Behavioral Fingerprinting of Internet-of-Things Devices”, *Wiley Interdisciplinary Reviews: Data Mining and Knowledge Discovery*, 11(1), 2021.
43. Hossein Shirazi, Bruhadeshwar Bezawada, Indrakshi Ray, and Charles Anderson, “Directed Adversarial Sampling Attacks on Phishing Detection”, *Journal of Computer Security*, 29(1), 2021.
44. Hajar Homayouni, Indrakshi Ray, Sudipto Ghosh, Shlok Gondalia, Michael G. Kahn, ”Anomaly Detection in COVID-19 Time-Series Data”, *Springer Nature Computer Science*, 2(4), 2021.
45. Hossein Shirazi, Katherine Haynes, and Indrakshi Ray, “Towards Performance of NLP Transformers on URL-Based Phishing Detection in Mobile Databases”, *Journal of Ubiquitous Systems and Pervasive Networks*, 17(1), 2022.
46. Shashika R. Muramudalige, Benjamin W. K. Hung, Anura P. Jayasumana, Indrakshi Ray, and Jytte Klausen, “Enhancing Investigative Pattern Detection via Inexact Matching and Graph Databases”, *IEEE Transactions on Services Computing*, 15(5), 2022.
47. Chaoyuan Zuo, Ritwik Banerjee, Hossein Shirazi, Fateme Hashemi Chalestori, and Indrakshi Ray, “Seeing Should Probably not be Believing: The Role of Deceptive Support in COVID-19 Misinformation on Twitter”, *Journal of Data and Information Quality* , 15(1), 2023.
48. Hossein Shirazi, Shashika Muramudalige, Indrakshi Ray, Anura Jayasumana, and Haonan Wang, “Adversarial Autoencoder Data Synthesis for Enhancing Machine Learning-Based Phishing Detection”, *IEEE Transactions on Services Computing* 16(4), 2023.
49. Matt Gorbett, Caspian Siebert, Hossein Shirazi, and Indrakshi Ray, “The Intrinsic Dimensionality of Network Datasets and Its Applications”, *Journal of Computer Security* 31(6), 2023.
50. Raghu Raman, Vinith Kumar Nai, Prema Nedungadi, Indrakshi Ray, and Krishnashree Achuthan, “Darkweb Research: Past, Present, and Future Trends and Mapping to Sustainable Goals”, *Helicon*, 9(11), 2023.

Book Chapters

1. Paul Ammann, Sushil Jajodia and Indrakshi Ray, “Semantics-Based Decomposition of Transactions”, *Advanced Transaction Models and Architectures*, Sushil Jajodia and Larry Kerschberg editors, Kluwer Academic Publishers, 1997, pages 153–180.
2. Indrakshi Ray, “Secure Transaction Processing”, *Encyclopedia of Database Systems*, Tamer Ozsu and Ling Liu editors, Springer, 2009, pages 2540–2546.
3. Rinku Dewri, Indrajit Ray, Indrakshi Ray and Darrell Whitley, “Multi-objective Evolutionary Optimization in Statistical Disclosure Control”, *Advances in Artificial Intelligence for Privacy Protection and Security*, Agusti Solanas and Antoni Martinez-Balleste editors, Imperial College Press, 2009, pages 117–144.
4. Indrajit Ray, Indrakshi Ray and Sudip Chakraborty, “A Context-Aware Model of Trust for Facilitating Secure Ad Hoc Collaborations”, *Trust Modeling and Management in Digital Environments: From Social Concept to System Development*, Zheng Yan editor, IGI Global, January 2010.
5. Siv Hilde Houmb, Geri Georg, Dorina C. Petriu, Behzad Bordbar, Indrakshi Ray, Kyriakos Anastasakis and Robert France, “Balancing Security and Performance Properties During System Architectural Design”, *Software Engineering for Secure Systems: Industrial and Research Perspectives*, Haralambos Mouratidis editor, IGI Global, October 2010.

6. Sharma Chakravarthy, Raman Adaikkalavan, Indrakshi Ray, Qingchun Jiang, and Xing Xie, "Sensor Technology and Data Streams Management", *Fundamental of Pervasive Information Management Systems*, Vijay Kumar editor, John Wiley & Sons, September 2013.
7. Indrakshi Ray and Thilina Buddhika, "Secure Transaction Processing", *Encyclopedia of Database Systems*, Ling Liu and Tamer Ozsu editors, Springer, 2018.
8. Bruhadeshwar Bezawada and Indrakshi Ray, "Attribute-Based Encryption: Applications and Future Directions", *From Database to Cyber Security*, Pierangela Samarati et al. editors, Springer, 2018.
9. Hajar Homayouni, Sudipto Ghosh, and Indrakshi Ray, "Data Warehouse Testing", *Advances in Computers*, Atif Memon editor, Elsevier, 2019.

Refereed Proceedings

1. Paul Ammann, Sushil Jajodia and Indrakshi Ray "Using Formal Methods to Reason About Semantic-Based Decomposition of Transactions", *Proceedings of the 21st International Conference on Very Large Databases*, Zurich, September 1995, Morgan-Kaufmann, pages 218–227. (Acceptance ratio 52/297)
2. Paul Ammann, Sushil Jajodia and Indrakshi Ray "Ensuring Atomicity of Multilevel Transactions", *Proceedings of the IEEE Symposium on Security and Privacy*, Oakland, CA, May 1996, IEEE Computer Society Press, pages 74–84. (Acceptance ratio 20/69)
3. Indrakshi Ray and Paul Ammann, "Using the B-Toolkit to Ensure Safety in SCR Specifications", *Proceedings of the 12th Annual Conference on Computer Assurance*, Gaithersburg, MD, June 1997, IEEE Computer Society Press, pages 1–12.
4. Sushil Jajodia, Indrakshi Ray and Paul Ammann, "Implementing Semantic-Based Decomposition of Transactions", *Proceedings of the 9th International Conference on Advanced Information Systems Engineering*, Barcelona, Catalonia, June 1997. Published as Lecture Notes in Computer Science, Vol. 1250, 1997, editors A. Olive and J. A. Pastor, Springer-Verlag, pages 75–88. (Acceptance ratio 30/112)
5. Indrakshi Ray and Indrajit Ray, "An Optimistic Fair-exchange E-commerce Protocol with Automated Dispute Resolution", *Proceedings of the 1st International Conference on Electronic Commerce and Web Technologies*, Greenwich, UK, September 2000. Published as Lecture Notes in Computer Science, Vol. 1875, 2000, editors K. Bauknecht, S. K. Madria, and G. Pernul, Springer-Verlag, pages 84–93. (Acceptance ratio 43/120)
6. Indrajit Ray, Indrakshi Ray and Natarajan Narasimhamurthi, "A Fair Exchange E-Commerce Protocol with Automated Dispute Resolution", *Proceedings of the 14th Annual IFIP WG 11.3 Working Conference on Database Security*, Schoorl, The Netherlands, August 2000. Published in Data and Applications Security: Developments and Directions, 2001, editors B. Thuraisingham, R. van de Riet, K. Dittrich and Z. Tari, Kluwer Academic Publishers, pages 27–38. (Acceptance ratio 23/54)
7. Indrakshi Ray and Indrajit Ray, "An Anonymous Fair-Exchange E-commerce Protocol", *Proceedings of the 15th International Parallel and Distributed Processing Symposium (First International Workshop on Internet Computing and E-Commerce)*, San Francisco, CA, April 2001, IEEE Computer Society Press, pages 1790–1797.
8. Indrajit Ray, Indrakshi Ray and Natarajan Narasimhamurthi, "An Anonymous Electronic Voting Protocol for Voting over the Internet", *Proceedings of the 3rd International Workshop on Advanced Issues of E-Commerce and Web-based Information Systems*, San Jose, CA, June 2001, IEEE Computer Society Press, pages 188–190.
9. Indrakshi Ray and Indrajit Ray, "Detecting Termination of Active Database Rules using Symbolic Model Checking", *Proceedings of the 5th East-European Conference on Advances in Databases and Information Systems*, Vilnius, Lithuania, September 2001. Published as Lecture Notes in Computer Science, Vol. 2151, 2001, editors A. Caplinskas and J. Eder, Springer-Verlag, pages 266-289. (Acceptance ratio 25/74)
10. Indrakshi Ray, Indrajit Ray and Natarajan Narsimhamurthi, "A Cryptographic Solution to Implement Access Control in a Hierarchy and More", *Proceedings of the 7th ACM Symposium on Access Control Models and Technologies*, Monterey, CA, June 2002, ACM Press, pages 65–73. (Acceptance ratio 17/53)

11. Indrajit Ray and Indrakshi Ray, "Anonymous and Secure Multicast Subscription", *Proceedings of the 16th Annual IFIP WG 11.3 Working Conference on Database and Applications Security*, Cambridge, U.K., July 2002. Published in *Research Directions in Data and Applications Security*, 2003, editors E. Gudes and S. Sheno, Kluwer Academic Publishers, pages 313–327.
12. Geri Georg, Robert France and Indrakshi Ray, "Designing High Integrity Systems using Aspects", *Proceedings of the 5th Annual IFIP WG 11.5 Working Conference on Integrity and Internal Control in Information Systems*, Bonn, Germany, November 2002. Published in *Integrity and Internal Control in Information Systems V*, 2003, editor M. Gertz, Kluwer Academic Publishers, pages 37–57. (Acceptance rate 50%)
13. Geri Georg, Indrakshi Ray and Robert France, "Using Aspects to Design a Secure System", *Proceedings of the 8th IEEE International Conference on Engineering of Complex Computer Systems*, Greenbelt, Maryland, December 2002, IEEE Computer Society Press, pages 117–128. [Winner of the Best Paper Award](#) (Acceptance ratio 23/49)
14. Indrakshi Ray, "Multi-level Secure Rules and Its Impact on the Design of Active Databases", *Proceedings of the 20th British National Conference on Databases*, Coventry, U.K., July 2003. Published as *Lecture Notes in Computer Science*, Vol. 2712, 2003, editors A. James, B. Lings and M. Younas, Springer-Verlag, pages 226-244. (Acceptance rate 30%)
15. Indrakshi Ray and Tai Xin, "Concurrent and Real-Time Update of Access Control Policies", *Proceedings of the 14th International Conference on Database and Expert Systems*, Prague, Czech Republic, September 2003. Published in *Lecture Notes in Computer Science*, Vol. 2736, 2003, editors V. Marik, W. Retschitzegger and O. Stepankova, Springer-Verlag, pages 330–339. (Acceptance ratio 91/236)
16. Indrakshi Ray, Na Li, Dae-Kyoo Kim and Robert France, "Using Parameterized UML to Specify and Compose Access Control Models", *Proceedings of the 6th IFIP WG 11.5 Conference on Integrity and Internal Control in Information Systems*, Lausanne, Switzerland, November 2003. Published in *Integrity and Internal Control in Information Systems VI*, 2004, editors S. Jajodia and L. Strauss, Kluwer Academic Publishers, pages 49–65.
17. Nitin Prabhu, Vijay Kumar, Indrakshi Ray and Gi-Chul Yang, "Concurrency Control in Mobile Database Systems", *Proceedings of the 18th International Conference on Advanced Networking and Applications*, Fukuoka, Japan, March 2004, IEEE Computer Society Press, pages 83–86. (Acceptance ratio 223/402)
18. Dae-Kyoo Kim, Indrakshi Ray, Robert France and Na Li, "Modeling Role-Based Access Control Using Parameterized UML Models", *Proceedings of the 7th Conference on Fundamental Approaches to Software Engineering*, Barcelona, Spain, March 2004. Published in *Lecture Notes in Computer Science series*, Vol. 2984, 2004, editors M. Wermelinger and T. Margaria-Steffen, Springer-Verlag, pages 180–193. (Acceptance rate 23%)
19. Indrakshi Ray, Na Li, Robert France and Dae-Kyoo Kim, "Using UML to Visualize Role-Based Access Control Constraints", *Proceedings of the 9th ACM Symposium on Access Control Model and Technologies*, Yorktown Heights, NY, June 2004, ACM Press, pages 115-124. (Acceptance ratio 18/61)
20. Nitin Prabhu, Vijay Kumar and Indrakshi Ray, "Periodic Scheduling in On-Demand Broadcast System", *Proceedings of the 3rd International Conference on Information Systems Technology and its Applications*, Salt Lake City, Utah, July 2004. Published in *Lecture Notes in Informatics series*, Vol. 48, 2004, editors A. E. Doroshenko, T. A. Halpin, S. W. Liddle, and H.C. Mayr, GI, pages 107-121. (Acceptance ratio 15/43)
21. Indrakshi Ray, Ross McConnell, Monte Lunacek and Vijay Kumar, "Reducing Damage Assessment Latency in Survivable Databases", *Proceedings of the 21st British National Conference on Databases (Short Paper)*, Edinburgh, Scotland, July 2004. Published in *Lecture Notes in Computer Science series*, Vol. 3112, 2004, editors H. Williams, L. MacKinnon, Springer-Verlag, pages 106–111. (Acceptance ratio 18/70)
22. Indrakshi Ray and Tai Xin, "Implementing Real-Time Update of Access Control Policies", *Proceedings of the 18th IFIP WG 11.3 Working Conference on Data and Application Security*, Sitges, Spain, July 2004. Published in *Research Directions in Data and Applications Security XVIII*, 2004, editors C. Farkas and P. Samarati, Kluwer Academic Publishers, pages 65–80. (Acceptance ratio 24/45)
23. Indrakshi Ray, Tai Xin and Yajie Zhu, "Ensuring Task Dependencies During Workflow Recovery", *Proceedings of the 15th International Conference on Database and Expert Systems Applications*, Zaragoza, Spain, August 2004. Published in *Lecture Notes in Computer Science series*, Vol. 3180, 2004, editors F. Galindo, M. Takizawa and R. Traunmuller, Springer, pages 24–33. (Acceptance ratio 92/304)

24. Indrakshi Ray and Mariana Muller, "Using Schemas to Simplify Access Control for XML Documents", *Proceedings of the 1st International Conference on Distributed Computing and Internet Technology* (Short Paper), Bhubaneswar, India, December 2004. Published in Lecture Notes in Computer Science series, Vol. 3347, 2004, editors R.K. Ghosh and H. Mohanty, Springer, pages 363–368. (Acceptance ratio 51/211)
25. Shuxin Yin and Indrakshi Ray, "Relational Database Operations Modeling with UML", To appear in *Proceedings of the IEEE 19th International Conference on Advanced Information Networking and Applications*, Taipei, Taiwan, March 2005, IEEE Computer Society Press, pages 927–932. (Acceptance rate 33%)
26. Eunjee Song, Raghu Reddy, Robert France, Indrakshi Ray, Geri Georg and Roger Alexander, "Verifiable Composition of Access Control and Application Features", *Proceedings of the 10th ACM Symposium on Access Control Methodologies and Technologies*, Stockholm, Sweden, June 2005, ACM Press, pages 120–129. (Acceptance ratio 19/90)
27. Tai Xin and Indrakshi Ray, "Detecting Dependency Conflicts in Advanced Transaction Models", *Proceedings of the 9th International Database Engineering and Applications Symposium*, Montreal, Canada, July 2005, IEEE Computer Society Press, pages 17–26. (Acceptance ratio for full papers 30/144)
28. Tai Xin, Yajie Zhu, and Indrakshi Ray, "Reliable Scheduling of Advanced Transactions", *Proceedings of the 19th IFIP WG 11.3 Working Conference on Data and Applications Security*, Storrs, Connecticut, August 2005. Published in Lecture Notes in Computer Science series, Vol. 3654, 2005, editors S. Jajodia and D. Wijesekera, Springer, pages 124–138. (Acceptance ratio 24/54)
29. Yajie Zhu, Tai Xin, and Indrakshi Ray, "Recovering from Malicious Attacks in Workflow Systems", *Proceedings of the 16th International Conference on Database and Expert Systems*, Copenhagen, Denmark, August 2005. Published in Lecture Notes in Computer Science series, Vol. 3588, 2005, editors K.V. Anderson, J. Debenham, and R. Wagner, Springer, pages 14–23. (Acceptance ratio 92/390)
30. Dan Matheson, Indrakshi Ray, Indrajit Ray, and Siv Hilde Houmb, "Building Security Requirement Patterns for Increased Effectiveness Early in the Development Process", *Proceedings of the Symposium on Requirements Engineering for Information Security* (Short Paper), Paris, France, August 2005. (Acceptance ratio 16/40)
31. Indrakshi Ray and Lijun Yu, "Short Paper: Towards a Location-Aware Role-Based Access Control Model", *Proceedings of the 1st IEEE Conference on Security and Privacy for Emerging Areas in Communication Networks* (Short Paper), Athens, Greece, September 2005, IEEE Computer Society Press, pages 234–236. (Acceptance ratio 52/164)
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37. Geri Georg, Siv Hilde Houmb and Indrakshi Ray, "Aspect-Oriented Risk-Driven Development of Secure Applications", *Proceedings of the 20th Annual IFIP Wg 11.3 Working Conference on Data and Applications Security*, Sophia Antipolis, France, July 2006. Published as Lecture Notes in Computer Science, Vol. 4127, 2006, editors E. Damiani and P. Liu, Springer, pages 282–296. (Acceptance ratio 22/56)
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50. Indrakshi Ray and Wei Huang, "Increasing Expressiveness of Composite Events Using Parameter Contexts", *Proceedings of the 12th East-European Conference on Advances in Databases and Information Systems*, Pori, Finland, September 2008, pages 215–230. (Acceptance ratio 21/63)

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57. Rinku Dewri, Darrell Whitley, Indrajit Ray and Indrakshi Ray, "A Multi-Objective Approach to Data Sharing with Privacy Constraints and Preference Based Objectives", *Proceedings of the Genetic and Evolutionary Computation Conference*, Montreal, Canada, July 2009, pages 1499–1506. (Acceptance ratio 220/531)
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60. Rinku Dewri, Indrajit Ray, Indrakshi Ray and Darrell Whitley, "POkA: Identifying Pareto-Optimal k -Anonymous Nodes in a Domain Hierarchy Lattice", *Proceedings of the 18th ACM Conference on Information and Knowledge Management*, Hong Kong, China, November 2009, pages 1037–1046. (Acceptance ratio 123/847)
61. Rinku Dewri, Indrakshi Ray, Indrajit Ray and Darrell Whitley, "Query m -Invariance: Preventing Query Disclosures in Continuous Location-Based Services", *Proceedings of the 11th International Conference on Mobile Data Management*, Kansas City, Missouri, May 2010, pages 95–104. (Acceptance ratio 16/63)
62. Rinku Dewri, Indrajit Ray, Indrakshi Ray and Darrell Whitley, "On the Identification of Property Based Generalizations in Microdata Anonymization", *Proceedings of the 24th Annual IFIP WG 11.3 Working Conference on Data and Applications Security*, Rome, Italy, June 2010, pages 81–96. (Acceptance ratio 18/61)
63. Siv Hilde Houmb, Sudip Chakraborty, Indrakshi Ray and Indrajit Ray, "Using Trust-Based Information Aggregation for Predicting Security Level of Systems", *Proceedings of the 24th Annual IFIP WG 11.3 Working Conference on Data and Applications Security*, Rome, Italy, June 2010, pages 241–256. (Acceptance ratio 18/61)
64. Rinku Dewri, Indrakshi Ray, Indrajit Ray and Darrell Whitley, "On the Formation of Historically k -Anonymous Anonymity Sets in a Continuous LBS", *Proceedings of the 6th International Conference on Security and Privacy in Communication Networks*, Singapore, September 2010, pages 71–88. (Acceptance ratio 28/112)
65. Wuliang Sun, Robert France and Indrakshi Ray, "Rigorous Analysis of UML Access Control Policy Models", *Proceedings of the IEEE International Symposium on Policies for Distributed Systems and Networks*, Pisa, Italy, June 2011, pages 9–16. (Acceptance ratio for full paper 16%)

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68. Lijun Yu, Robert B. France, Indrakshi Ray, and Wuliang Sun, "Systematic Scenario-Based Analysis of UML Design Class Models", *Proceedings of the 17th IEEE International Conference on Engineering of Complex Computer Systems*, Paris, France, July 2012, pages 86–95. (Acceptance rate 29%)
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71. Mustafa Al-Lail, Ramadan Abdunabi, Robert France, and Indrakshi Ray, "Rigorous Analysis of Temporal Access Control Properties in Mobile Systems (Short Paper)", *Proceedings of the 18th International Conference on Engineering of Complex Computer Systems*, Singapore, July 2013, pages 246–251. (Acceptance ratio for all papers: 38/102)
72. Indrajit Ray, Dieudonne Mulamba, Indrakshi Ray, and Keesook Han, "A Model for Trust-based Access Control and Delegation in Mobile Clouds", *Proceedings of the 27th Annual IFIP WG 11.3 Working Conference on Data and Applications Security and Privacy*, Newark, New Jersey, July 2013, pages 242–257. (Acceptance ratio for full papers: 16/45)
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74. Xing Xie, Indrakshi Ray, and Raman Adaikkalavan, "On the Efficient Processing of Multilevel Secure Continuous Queries (Short Paper)", *Proceedings of the ASE/IEEE International Conference on Privacy, Security, Risk and Trust*, Washington D.C., September 2013, pages 417–422. (Acceptance rate for short papers: 7%)
75. Kirill Belyaev, Indrakshi Ray, Indrajit Ray, and Gary Luckasen, "Personal Health Record Storage on Privacy Preserving Green Clouds", *Proceedings of the 9th IEEE International Conference on Collaborative Computing: Networking, Applications and Worksharing*, Austin, TX, October 2013. pages 448–457. (Acceptance rate: 27%)
76. Tarik Moataz, Nora Cuppens-Boulahia, Frederic Cuppens, Indrajit Ray, and Indrakshi Ray, "ELITE: zEro Links Identity management system", *Proceedings of the 28th Annual IFIP WG 11.3 Working Conference on Data and Applications Security and Privacy*, Vienna, Austria, July 2014. (Acceptance ratio: 22/63)
77. Tarik Moataz, Benjamin Justus, Indrakshi Ray, Nora Cuppens-Boulahia, Frederic Cuppens, and Indrajit Ray, "Privacy-Preserving Multiple Keyword Search on Outsourced Data in the Clouds", *Proceedings of the 28th Annual IFIP WG 11.3 Working Conference on Data and Applications Security and Privacy*, Vienna, Austria, July 2014. (Acceptance ratio: 22/63)
78. Negar Mosharraf, Anura P. Jayasumana, and Indrakshi Ray, "A Responsive Defense Mechanism against DDoS Attacks" (Short Paper), *Proceedings of the 7th International Symposium on Foundations and Practice of Security*, Montreal, Canada, November 2014. (Acceptance ratio including short papers: 25/48)
79. Phillipa Bennett, Indrakshi Ray, Robert B. France, "Analysis of a Relationship-Based Access Control Model", *Proceedings of the 8th International C* Conference on Computer Science & Software Engineering*, Yokohama, Japan, July 2015.
80. Ibrahim Lazrig, Tarik Moataz, Indrajit Ray, Indrakshi Ray, Toan Ong, Michael G. Kahn, Frederic Cuppens, and Nora Cuppens-Boulahia, "Privacy-Preserving Record Matching Using Automated Semi-trusted Broker", *Proceedings of the 29th Annual IFIP WG 11.3 Working Conference on Data and Applications Security and Privacy*, Fairfax, VA, July 2015. (Acceptance ratio for full papers: 18/45)

81. Indrakshi Ray, Raman Adaikkalavan, Xing Xie, and Rose Gamble, "Stream Processing with Secure Information Flow Constraints", *Proceedings of the 29th Annual IFIP WG 11.3 Working Conference on Data and Applications Security and Privacy*, Fairfax, VA, July 2015. (Acceptance ratio for full papers: 18/45)
82. Kirill Belyaev and Indrakshi Ray, "Towards Efficient Dissemination and Filtering of XML Data Streams", *Proceedings of the 13th IEEE International Conference on Dependable, Autonomic, and Secure Computing*, Liverpool, UK, October 2015. (Acceptance ratio 30%)
83. Phillipa Bennett, Indrakshi Ray, and Robert France, "Modeling of Online Social Network Policies using Attribute-Based Access Control Framework", *Proceedings of the 11th International Conference on Information Systems Security*, Kolkata, India, December 2015. (Acceptance rate for full papers 24/133)
84. Indrakshi Ray, Toan Ong, Indrajit Ray, and Michael Kahn, "Applying Attribute-Based Access Control for Privacy Preserving Health Data Disclosure", *Proceedings of the International Conference on Biomedical and Health Informatics*, Las Vegas, NV, February 2016.
85. Dieudonne Mulamba, Indrajit Ray, and Indrakshi Ray, "SybilRadar: A Graph-Structure Based Framework for Sybil Detection in On-line Social Networks", *Proceedings of the International Information Security and Privacy Conference*, Ghent, Belgium, May 2016. (Acceptance rate 27/139)
86. Kirill Belyaev and Indrakshi Ray, "Empowering Applications with Seshat for Processing of XML Data Streams" (Short Paper), *Proceedings of the 20th International Database Engineering and Applications Symposium*, Montreal, Canada, July 2016. (Acceptance rate 29%)
87. Ibrahim Lazrig, Toan Ong, Indrajit Ray, Indrakshi Ray, and Michael Kahn, "Privacy Preserving Probabilistic Record Linkage Using Locality Sensitive Hashes", *Proceedings of the 30th Annual IFIP WG 11.3 Working Conference on Data and Applications Security and Privacy*, Trento, Italy, July 2016. (Acceptance ratio 17/54)
88. Kirill Belyaev and Indrakshi Ray, "Towards Access Control for Isolated Applications" **Winner of the Best Student Paper Award**, *Proceedings of the 13th International Conference on Security and Cryptography* Lisbon, Portugal, July 2016. (Acceptance ratio 15/108)
89. Kirill Belyaev and Indrakshi Ray, "Component-Oriented Access Control for Deployment of Application Services in Containerized Environments", *Proceedings of the 15th International Conference on Cryptology and Network Security* Milan, Italy, November 2016. (Acceptance ratio 30/116)
90. Negar Mosharraf, Anura P. Jayasumana, and Indrakshi Ray, "Compacted Bloom Filter", *Proceedings of the 2nd International Conference on Collaboration and Internet Computing*, Pittsburgh, PA, November 2016. (Acceptance ratio 50/56)
91. Majdi Khalid, Indrakshi Ray, and Hamidreza Chitsaz "Confidence-Weighted Bipartite Ranking" (Spotlight Research Paper), *Proceedings of the 12th International Conference on Advanced Data Mining and Applications*, Gold Coast, Australia, December 2016. (Acceptance ratio 18/105)
92. Subhojeet Mukherjee, Hossein Shirazi, Indrakshi Ray, Jeremy Daily, and Rose Gamble, "Demonstrating Practical Denial-of-Service Attacks in Embedded Networks of Commercial Vehicles", *Proceedings of the 12th International Conference on Information Systems Security*, Kolkata, India, December 2016. (Acceptance ratio 25/196)
93. Indrakshi Ray, Bithin Alangot, Shilpa Nair, and Krishnashree Achuthan, "Using Attribute-Based Access Control for Remote Healthcare Monitoring", *Proceedings of the 4th International Conference on Software Defined Systems*, Valencia, Spain, May 2017. (Acceptance rate 40%)
94. Negar Mosharraf, Anura Jayasumana, and Indrakshi Ray, "A Distributed Mechanism to Protect Against DDoS Attacks" (Short Paper) *Proceedings of the 31st Annual IFIP WG 11.3 Working Conference on Data and Applications Security and Privacy*, Philadelphia, Pennsylvania, July 2017. (Acceptance ratio 30/59)
95. Negar Mosharraf, Anura Jayasumana, and Indrakshi Ray, "Using a History-Based Profile to Detect and Respond to DDoS Attacks", *Proceedings of the 14th International Conference on Security and Cryptography*, Madrid, Spain, July 2017. (Acceptance ratio 14%)
96. Hossein Shirazi, Kyle Haefner, and Indrakshi Ray, "Fresh-Phish: A Framework for Auto-Detection of Phishing Websites", *Proceedings of the International Conference on Information Reuse and Integration*, San Diego, California, August 2017. (Acceptance ratio 54%)

97. Subhojeet Mukherjee, Jacob Walker, Indrakshi Ray, and Jeremy Daily, "A Precedence Graph Based Approach to Detect Message Injection Attacks in J1939 Based Networks", *Proceedings of the 15th International Conference on Privacy, Security, and Trust*, Calgary, Canada, August 2017. (Acceptance ratio for regular papers 32/106)
98. Rejina Basnet, Subhojeet Mukherjee, Vignesh M. Pagadala, and Indrakshi Ray, "An Efficient Implementation of Next Generation Access Control for the Mobile Health Cloud", *Proceedings of the 3rd International Conference on Fog and Mobile Edge Computing*, Barcelona, Spain, April 2018. (Acceptance ratio 42%)
99. Hossein Shirazi, Bruhadeshwar Bezawada, and Indrakshi Ray, "Know Thy Domain Name: Unbiased Phishing Detection using Domain Name Based Features" (Short Paper), *Proceedings of the 23rd ACM Symposium on Access Control Models and Technologies*, Indianapolis, IN, June 2018. (Acceptance ratio 40%)
100. Bruhadeshwar Bezawada, Sandeep Kulkarni, Indrajit Ray, Indrakshi Ray and Rui Li, "Independent Key Distribution Protocols for Broadcast Authentication", *Proceedings of the 23rd ACM Symposium on Access Control Models and Technologies*, Indianapolis, IN, June 2018. (Acceptance ratio 40%)
101. Hajar Homayouni, Sudipto Ghosh, and Indrakshi Ray, "An Approach for Testing the Extract-Transform-Load Process in Data Warehouse Systems", *Proceedings of the 22nd International Database Engineering & Applications Symposium*, Villa San Giovanni, Italy, June 2018. (Acceptance ratio 37%)
102. Ibrahim Lazrig, Toan Ong, Indrakshi Ray, Indrajit Ray, Xiaoqian Jiang, and Jaideep Vaidya, "Privacy Preserving Probabilistic Record Linkage without Trusted Third Party", *Proceedings of 16th Annual Conference on Privacy, Security, and Trust*, Belfast, Northern Ireland, August 2018. (Acceptance ratio 26%)
103. Dieudonne Mulamba, Indrajit Ray, and Indrakshi Ray, "On Sybil Classification in Online Social Networks using only Structural Features", *Proceedings of 16th Annual Conference on Privacy, Security, and Trust*, Belfast, Northern Ireland, August 2018. (Acceptance ratio 26%)
104. Kirill Belyaev and Indrakshi Ray, "Towards Service Orchestration in XML Filtering Overlays" (Short Paper), *Proceedings of the 22nd European Conference on Advances in Databases and Information Systems*, Budapest, Hungary, September 2018. (Acceptance ratio inclusive of short papers 28/70)
105. Majdi Khalid, Indrakshi Ray, and Hamidreza Chitsaz, "Scalable Nonlinear AUC Maximization Methods", *Proceedings of the European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases*, Dublin, Ireland, September 2018. (Acceptance ratio 92/354)
106. Vignesh Pagadala and Indrakshi Ray, "Achieving Mobile Health Privacy using Attribute-Based Access Control", *Proceedings of the 11th International Symposium on Foundations and Practice of Security*, Montreal, Canada, November 2018. (Acceptance ratio 15/47)
107. Hossein Shirazi, Bruhadeshwar Bezawada, Indrakshi Ray, and Chuck Anderson, "Adversarial Sampling Attacks against Phishing Detection", *Proceedings of the 33rd Annual IFIP WG 11.3 Conference on Data and Applications Security and Privacy*, Charleston, South Carolina, July 2019. **Winner of Best Student Paper Award** (Acceptance ratio 15/52)
108. Hajar Homayouni, Sudipto Ghosh, and Indrakshi Ray, "ADQuaTe: An Automated Data Quality Test Approach for Constraint Discovery and Fault Detection", *Proceedings of the 20th International Conference on Information Reuse and Integration for Data Science*, Los Angeles, California, July 2019. (Acceptance ratio 37%)
109. Shashika Muramudalige, Benjamin Hung, Anura Jayasumana and Indrakshi Ray, "Investigative Graph Search using Graph Databases", *Proceedings of 1st International Conference on Graph Computing*, Laguna Hills, California, September 2019. (Acceptance ratio 48%)
110. Hossein Shirazi, Indrakshi Ray and Charles Anderson, "Using Machine Learning to Detect Anomalies in Embedded Networks in Heavy Vehicles", *Proceedings of the 12th International Symposium on Foundations and Practice of Security*, Toulouse, France, November 2019. (Acceptance rate 19/50)
111. Hajar Homayouni, Sudipto Ghosh, Indrakshi Ray, and Michael Kahn, "An Interactive Data Quality Test Approach for Constraint Discovery and Fault Detection", *Proceedings of the IEEE International Conference on Big Data* (accepted as a short paper), Los Angeles, California, December 2019. (Acceptance ratio 211/550)
112. Andrew Dolan, Indrakshi Ray, and Suryadipta Majumdar, "Proactively Extracting IoT Device Capabilities: An Application to Smart Homes", *Proceedings of the 34th Annual IFIP WG 11.3 Conference on Data and Applications Security and Privacy*, June 2020. (Acceptance rate 34%)

113. Hossein Shirazi, Landon Zweigle, and Indrakshi Ray, "A Machine Learning Based Unbiased Phishing Detection Approach", *Proceedings of the 17th International Conference on Security and Cryptography* (accepted as a short paper), July 2020. (Acceptance rate 41%)
114. Majdi Khalid, Hamidreza Chitsaz, and Indrakshi Ray, "Proximal Stochastic AUC Maximization", *Proceedings of the International Joint Conference on Neural Networks*, Glasgow, U.K., July 2020. (Acceptance rate 57%)
115. Hossein Shirazi, Shashika Muramudalige, Indrakshi Ray, and Anura Jayasumana, "Improved Phishing Detection Algorithms Using Adversarial Autoencoder Synthesized Data", *Proceedings of the IEEE Conference on Local Computer Networks* **Winner of the Best Paper Finalist Award**, Virtual, October 2020. (Acceptance rate 31.3%)
116. Sowmya Ravidas, Indrakshi Ray, and Nicola Zannone, "Handling Incomplete Information in Policy Evaluation using Attribute Similarity", *Proceedings of the IEEE International Conference on Trust, Privacy, and Security in Intelligent Systems and Applications*, Virtual Conference, December 2020. (Acceptance ratio 9/20)
117. Hajar Homayouni, Sudipto Ghosh, Indrakshi Ray, Shlok Gondalia, Jerry Duggan, Michael G. Kahn, "An Autocorrelation-based LSTM-Autoencoder for Anomaly Detection on Time-Series Data", *IEEE Big Data at the Special Session: Machine Learning on Big Data*, Virtual Conference, December 2020.
118. Brandt Reutimann and Indrakshi Ray, "Simulating and Detecting Measurement Attacks in SCADA Testbeds", *IFIP WG 11.10 International Conference on Critical Infrastructure Protection*, Virtual Conference, March 2021. (Acceptance rate 50%)
119. Vishwajeet Bhosale, Lorenzo De Carli, and Indrakshi Ray, "Detection of Anomalous User Activity for Home IoT Devices" (Short Paper), Virtual Conference, *International Conference on Internet of Things, Big Data, and Security*, Virtual Conference, April 2021.
120. Kyle Haefner and Indrakshi Ray, "Trust and Verify: A Complexity-Based IoT Behavioral Enforcement Model", *Proceedings of the 5th International Symposium on Cyber Security Cryptology and Machine Learning*, Beer Sheva, Israel, July 2021. (Acceptance rate 48%)
121. Katherine Haynes, Hossein Shirazi, and Indrakshi Ray, "Lightweight URL-based Phishing Detection using Natural Language Processing Transformers for Mobile Devices", *Proceedings of the 18th International Conference on Mobile Systems and Pervasive Computing*, Leuven, Belgium, August 2021.
122. Lorenzo De Carli, Indrakshi Ray, and Erin T. Solovey, "Vision: Stewardship of Smart Devices Security for the Aging Population", *Proceedings of the European Symposium on Usable Security*, **Winner of the Honorary Mention Award** October 2021. (Acceptance ratio: 22/62 including full and vision papers)
123. Upakar Paudel, Andy Dolan, Suryadipta Majumdar, and Indrakshi Ray, "Context-Aware IoT Device Functionality Extraction from Specifications for Ensuring Consumer Security", *Proceedings of the 9th IEEE Conference on Communications and Network Security*, October 2021. (Acceptance ratio 32/113).
124. Shalin Kumar Deval, Meenakshi Tripathi, Bruhadeshwar Bezawada, and Indrakshi Ray, "X-Phish: Days of Future Past: Adaptive & Privacy Preserving Phishing Detection", *Proceedings of the 9th IEEE Conference on Communications and Network Security*, October 2021. (Acceptance ratio 32/113).
125. Saja Alqurashi, Hossein Shirazi, and Indrakshi Ray, "On the Performance of Isolation Forest and Multi Layer Perceptron for Anomaly Detection in Industrial Control Systems Networks", *Proceedings of the International Conference on Internet of Things, Systems, Management, and Security*, December 2021.
126. Sina Mahdipour Saravani, Indrajit Ray, and Indrakshi Ray, "Automated Identification of Social Media Bots using Deepfake Text Detection", *Proceedings of the 17th International Conference on Information Systems Security*, Patna, India, December 2021.
127. Joaquin Cuomo, Hajar Homayouni, Indrakshi Ray, and Sudipto Ghosh, "Detecting Temporal Dependencies in Data", *Proceedings of the British International Conference on Databases*, London, U.K., March 2022.
128. Hossein Shirazi, William Pickard, Indrakshi Ray, and Haonan Wang, "Towards Resiliency of Heavy Vehicles through Compromised Sensor Data Reconstruction", *Proceedings of the 12th ACM Conference on Data and Application Security and Privacy*, Baltimore, MD, April 2022. (Acceptance ratio 26/112)

129. Shradha Neupane, Faiza Tazi, Upakar Paudel, Freddy Veloz Baez, Merzia Adamjee, Lorenzo De Carli, Sanchari Das, and Indrakshi Ray, “On the Data Privacy, Security, and Risk Postures of IoT Mobile Companion Apps”, *Proceedings of the 36th IFIP WG 11.3 on Data Applications Security and Privacy*, Newark, NJ, July 2022. (Acceptance rate for full papers 36%)
130. Matt Gorbett, Hossein Shirazi, and Indrakshi Ray, “Local Intrinsic Dimensionality of IoT Networks for Un-supervised Intrusion Detection”, *Proceedings of the 36th IFIP WG 11.3 on Data Applications Security and Privacy*, Newark, NJ, July 2022. (Acceptance rate for full papers 36%)
131. Martin Trae Span, Shwetha Gowdanakatte, Jeremy Daily, Indrakshi Ray, and Kamran Shahroudi, “Systems Thinking and Model Based Systems Engineering’s Utility to Solve Complex Organizational Problems – Cyber-Physical System Design Teams”, *Proceedings of the IEEE International Symposium on Systems Engineering*, Vienna, Austria, October 22.
132. Faiza Tazi, Griffin Opp, Shradha Neupane, Sanchari Das, Lorenzo De Carli, and Indrakshi Ray, “Accessibility Evaluation of IoT Android Mobile Companion Apps”, *Proceedings of the ACM CHI Conference on Human Factors in Computing Systems*, Hamburg, Germany, April 2023. (Acceptance ratio for Late Breaking Work 327/967)
133. Mahmoud Abdelgawad, Indrakshi Ray, Saja Alqurashi, Videep Venkatesha, and Hossein Shirazi, “Synthesizing and Analyzing Attribute-Based Access Control Model from Natural Language Policy Statements” (Short Paper), *Proceedings of the ACM Symposium on Access Control Models and Technologies*, Trento, Italy, June 2023. (Acceptance ratio including short papers 14/49)
134. Indrajit Ray, Bhavani Thuraisingham, Jaideep Vaidya, Sharad Mehrotra, Vijayalakshmi Atluri, Indrakshi Ray, Murat Kantarcioglu, Ramesh Raskar, Babak Salimi, Steve Simske, Nalini Venkatasubramanian, and Vivek Singh, “SAFE-PASS: Stewardship, Advocacy, Fairness and Empowerment in Privacy, Accountability, Security, and Safety for Vulnerable Groups” (Blue Sky Vision Paper), *Proceedings of the ACM Symposium on Access Control Models and Technologies*, Trento, Italy, June 2023.
135. Asif Uz Zaman, Hossein Shirazi, and Indrakshi Ray, “Machine Learning-Based Phishing Detection using URL Features: A Comprehensive Review”, *Proceedings of the International Symposium on Stabilization, Safety, and Security of Distributed Systems*, Jersey City, New Jersey, October 2023.
136. Mahmoud Abdelgawad, Indrakshi Ray, and Tomas Vasquez, “Workflow Resilience for Mission Critical Systems”, *Proceedings of the International Symposium on Stabilization, Safety, and Security of Distributed Systems*, Jersey City, New Jersey, October 2023.
137. Matt Gorbett, Hossein Shirazi, and Indrakshi Ray, “Sparse Binary Transformers for Multivariate Time Series Modeling”, *Proceedings of the ACM SIGKDD Conference on Knowledge Discovery and Data Mining*, Long Beach, California, August 2023. (Acceptance ratio 313/1416)
138. Indrajit Ray, Sarath Sreedharan, Rakesh Poddar, Shadaab Kawnain Bashir, and Indrakshi Ray, “Explainable AI for Prioritizing and Deploying Defenses for Cyber-Physical System Resiliency”, *Proceedings of the 5th International Conference on Trust, Privacy, and Security in Intelligent Systems and Applications*, Atlanta, GA, November 2023.
139. Maxwel Bar-On, Bruhadeshwar Bezawada, Indrakshi Ray and Indrajit Ray, “A Small World – Privacy Preserving IoT Device-Type Fingerprinting with Small Datasets”, *Proceedings of the 16th International Symposium on Foundations and Practice of Security*, Bordeaux, France, December 2023.
140. Mahmoud Abdelgawad and Indrakshi Ray, “Methodology for Resiliency Analysis of Mission-Critical Systems”, *Proceedings of the 39th ACM/SIGAPP Symposium on Applied Computing*, Avila, Spain, April 2024. (Acceptance rate 25%)

Posters, Workshop, and Fast Abstract Publications

1. Indrajit Ray, Bruce Maxim, Kiumi Akingbehin, Indrakshi Ray and Qiang Zhu, “Design of a Center for Research in Information System Security”, *Proceedings of the 18th Annual AoM/IAoM International Conference*, San Antonio, TX, August 2000, pages 131–136.

2. Indrakshi Ray and Indrajit Ray, "Failure Analysis of an E-commerce Protocol Using Model Checking", *Proceedings of the 2nd International Workshop on Advanced Issues of E-Commerce and Web-based Information Systems*, Milpitas, CA, June 2000, IEEE Computer Society Press, pages 176–183.
3. Indrakshi Ray and Indrajit Ray, "Using Compatible Keys for Secure Multicasting in E-commerce", *Proceedings of the 16th International Parallel and Distributed Processing Symposium (Second Workshop on Internet Computing and E-Commerce)*, Fort Lauderdale, FL, April 2002, IEEE Computer Society Press, pages 225–232. (Acceptance ratio 16/43)
4. Geri Georg, Robert France and Indrakshi Ray, "An Aspect-Based Approach to Modeling Security Concerns Aspects", *Proceedings of the Workshop on Critical Systems Development using UML*, Dresden, Germany, September 2002, pages 107–120.
5. Robert France, Geri Georg and Indrakshi Ray, "Supporting Multi-Dimensional Separation of Concerns", *Proceedings of the Workshop on Aspect-Oriented Modeling with UML*, Boston, MA, March 2003.
6. Geri Georg, Robert France and Indrakshi Ray, "Creating Security Mechanism Aspect Models from Abstract Aspect Security Models", *Proceedings of the Workshop on Critical Systems Development using UML*, San Francisco, CA, October 2003.
7. Geri Georg, Robert France and Indrakshi Ray, "Composing Aspect Models", *Proceedings of the Workshop on Aspect-Oriented Modeling with UML*, San Francisco, CA, October 2003.
8. Robert France, Sudipto Ghosh, Indrakshi Ray, James Bieman and Roger Alexander, "Evaluating Competing Dependability Concern Realizations in an Aspect-Oriented Modeling Framework", *Supplementary Proceedings of the International Symposium on Software Reliability Engineering*, Denver, CO, November 2003. (Acceptance ratio 40/51)
9. Indrakshi Ray, Elisa Bertino, Anna C. Squicciarini, and Elena Ferrari, "Anonymity Preserving Techniques in Trust Negotiations", *Proceedings of the Workshop on Privacy Enhancing Technologies*, Dubrovnik, Croatia, May 2005. To be published in Lectures Notes in Computer Science series. (Acceptance ratio 18/74)
10. Shuxin Yin, Indrakshi Ray and Indrajit Ray, "A Trust Model for Pervasive Computing Environments", *Proceedings of Workshop on Trusted Collaboration*, November 2006.
11. Indrakshi Ray, Geri Georg and Siv Hilde Houmb, "An Aspect-Oriented Risk-Driven Approach for Developing Mission Critical Applications", Position Paper accepted in *National Workshop on High-Confidence Software Platforms for Cyber-Physical Systems*, Alexandria, Virginia, November 2006.
12. Nayot Poolsappasit and Indrakshi Ray, "Towards a Scalable Model for Location Privacy", *Proceedings of International Workshop on Security and Privacy in GIS and LBS*, Irvine, California, November 2008, pages 46–51.
13. Indrakshi Ray, "Challenges in Securing Pervasive Computing Applications", *Proceedings of the NSF Workshop on Data and Applications Security*, Arlington, Virginia, February 2009.
14. Indrakshi Ray and Indrajit Ray, "Access Control Challenges for Cyber-Physical Systems", *Proceedings of the 1st Workshop on Cyber-physical Systems Security*, Newark, New Jersey, July 2009.
15. Indrakshi Ray, Sanjay Madria, and Mark Linderman, "Query Plan Execution in a Heterogeneous Stream Management System for Situational Awareness", *Proceedings of the 5th Workshop on Dependable Network Computing and Mobile Systems*, Irvine, California, October 2012, pages 424–429.
16. Sarra M. Alqahtani, Rose Gamble, and Indrakshi Ray, "Auditing Requirements for Implementing the Chinese Wall Model in the Service Cloud", *Proceedings of the International Workshop on Cloud Security Auditing*, Santa Clara, California, June 2013, pages 298–305.
17. Xing Xie, Indrakshi Ray, Waruna Ranasinghe, Philips A. Gilbert, Pramod Shashidhara, and Anoop Yadav, "Query Plan Execution in a Heterogeneous Stream Management System for Situational Awareness", *Proceedings of the 12th International Workshop on Assurance in Distributed Systems and Networks*, Philadelphia, July 2013, pages 368–373.
18. Wuliang Sun, Robert France, and Indrakshi Ray, "Analyzing Behavioral Refactoring of Class Models", *Proceedings of the Workshop on Models and Evolution*, Miami, Florida, October 2013, pages 70–79.

19. Mustafa Al-Lail, Ramadan Abdunabi, Robert France and Indrakshi Ray, "An Approach to Analyzing Temporal Properties in UML Class Models", *Proceedings of the 10th International Workshop on Model Driven Engineering, Verification and Validation*, Miami, Florida, October 2013, pages 77–86.
20. Prabhakaran Murugesan and Indrakshi Ray, "Audit Log Management in MongoDB", *Proceedings of the International Workshop on Cloud Security Auditing co-located with IEEE World Congress on Services*, Anchorage, Alaska, June 2014, pages 53–57.
21. Curtis C. R. Busby Earle, Robert B. France and Indrakshi Ray, "Analysing Requirements to Detect Latent Security Vulnerabilities", *Trustworthy Computing Workshop co-located with International Conference on Software Security and Reliability*, San Francisco, California, June 2014, pages 168–175.
22. Thilina Buddhika, Indrakshi Ray, Mark Linderman and Anura Jayasumana, "Secure Complex Event Processing in a Heterogeneous and Dynamic Network", *Proceedings of SPIE 9079, Ground/Air Multisensor Interoperability, Integration, and Networking for Persistent ISR*, Baltimore, Maryland, June 2014.
23. Phillipa Bennett, Wuliang Sun, Wade Ted, Geri Georg, Indrakshi Ray and Michael Kahn, "Analyzing Regulatory Conformance in Medical Research Systems Using Multi-Paradigm Modeling", *Proceedings of the 9th International Workshop on Multi-Paradigm Modeling*, Ottawa, Canada, October 2015.
24. Andy Hsu and Indrakshi Ray, "Specification and Enforcement of Location-Aware Attribute-Based Access Control for Online Social Networks", *Proceedings of ACM Workshop on Attribute Based Access Control*, New Orleans, LA, March 2016.
25. Subhojeet Mukherjee, Indrakshi Ray, Indrajit Ray, Toan Ong, and Michael G. Kahn, "Leveraging Attribute Based Access Control to Ensure Fine-Grained Access Control to FHIR Resources", *Proceedings of ACM Workshop on Attribute Based Access Control*, Scottsdale, AZ, March 2017.
26. Subhojeet Mukherjee, Noah Cain, Jacob Walker, David White, Indrajit Ray, and Indrakshi Ray, "POSTER: PenJ1939: An Interactive Framework for Design and Dissemination of Exploits for Commercial Vehicles", *Proceedings of the ACM Conference on Computer and Communications Security*, Dallas, TX, October 2017.
27. Diptendu Mohan Kar, Ibrahim Lazrig, Indrajit Ray, and Indrakshi Ray, "POSTER: PriReMat: A Distributed Tool for Privacy Preserving Record Linking in Healthcare", *Proceedings of the ACM Conference on Computer and Communications Security*, Dallas, TX, October 2017.
28. Bruhadeshwar Bezawada, Kyle Haefner, and Indrakshi Ray, "Securing Home IoT Environments with Attribute-Based Access Control", *Proceedings of ACM Workshop on Attribute Based Access Control*, Tempe, AZ, March 2018.
29. Bruhadeshwar Bezawada, Maalvika Bachani, Jordan Peterson, Hossein Shirazi, Indrakshi Ray and Indrajit Ray, "Behavioral Fingerprinting of Internet-of-Things Devices", *Proceedings of the Workshop on Attacks and Solutions in Hardware Security*, Toronto, Canada, October 2018.
30. Lorenzo De Carli, Erin Solovey and Indrakshi Ray, "Enabling IoT Residential Security Stewardship for the Aging Population", *Proceedings of Designing Interactions for the Ageing Population*, Honolulu, Hawaii, April 2020.
31. Sina Mahdipour Saravani, Ritwik Banerjee and Indrakshi Ray, "An Investigation into the Contribution of Locally Aggregated Descriptors to Figurative Language Identification", *Proceedings of Workshop on Insights from Negative Results in NLP*, Punta Cana, Dominican Republic, November 2021. (Acceptance rate 51%)
32. Shwetha Gowdanakatte, Indrakshi Ray, and Siv Hilde Houmb, "Attribute-Based Access Control Model for Protecting Programmable Logic Controls", *Proceedings of ACM Workshop on Secure and Trustworthy Cyber-Physical Systems*, April 2022.
33. Vinayak Prabhu, Mohit Singh, Indrajit Ray, Indrakshi Ray, and Sudipto Ghosh, "Detecting Secure Memory Deallocation Violations with CBMC", *Proceedings of ACM Cyber-Physical System Security Workshop*, June 2022. (Acceptance ratio 8/19)
34. Fateme Hashemi Chaleshtori and Indrakshi Ray, "Automation of Vulnerability Information Extraction using Transformer-Based Language Models", *Proceedings of the 1st International Workshop on System Security Assurance*, Denmark, Copenhagen, September 2022. (Acceptance rate 50%).

35. Matt Gorbett, Hossein Shirazi, and Indrakshi Ray, “Sparse and Binary Transformers for Multivariate Time Series Modeling”, *Proceedings of ICLR Workshop on Neural Networks*, Kigali, Rwanda, May 2023.
36. Noushin Salek Faramarzi, Fateme Hashemi Chaleshtori, Hossein Shirazi, Indrakshi Ray and Ritwik Banerjee, “Claim Extraction and Dynamic Stance Detection in COVID-19 Tweets”, *Proceedings of the 11th Workshop on Natural Language Processing for Social Media* (co-hosted with WWW), Austin, TX, April, 2023.
37. Eric Burton, Hossein Shirazi and Indrakshi Ray, “Poster: Towards a Dataset for the Discrimination between Warranted and Unwarranted Emails”, *Proceedings of the ACM SIGSAC Conference on Computer and Communications Security*, Copenhagen, Denmark, November 2023.
38. Shwetha Gowdanakatte, Mahmoud Abdelgawad and Indrakshi Ray, “Security Hardening of Industrial Control Systems using Attribute Based Access Control”, *Proceedings of the 9th Annual Industrial Control System Security Workshop*, Austin, Texas, December 2023.
39. Chandrima Ghatak, Saira Jabeen, Indrakshi Ray and Hossein Shirazi, “Improving the Resiliency of Embedded Networks in Heavy Vehicles”, *Proceedings of the 9th Annual Industrial Control System Security Workshop*, Austin, Texas, December 2023.

Other Refereed Publications

1. Indrajit Ray and Indrakshi Ray, “Fair-Exchange in E-Commerce”, *SIGecom Exchanges*, Volume 3.2, Spring 2002, pages 9–17.

Invited Proceedings Publications

1. Kyle Haefner and Indrakshi Ray, “Complex IoT: Behavior-Based Trust for IoT Networks”, *Proceedings of the 1st International Conference on Trust, Privacy, and Security in Intelligent Systems, and Applications*, Los Angeles, CA, December 2019.
2. Ritwik Banerjee and Indrakshi Ray, “Prevention, Detection, and Cure for Misinformation”, *Proceedings of the 3rd IEEE International Conference on Cognitive Machine Intelligence*, Virtual, December 2021.
3. Shwetha Gowdanakatte, Indrakshi Ray, Mahmoud Abdelgawad, “Model Based Risk Assessment and Risk Mitigation Framework for Cyber-Physical Systems”, *Proceedings of the 5th International Conference on Trust, Privacy, and Security in Intelligent Systems, and Applications*, Atlanta, GA, November 2023.

Books Edited

- Editor (with Sabrina De Capitani di Vimercati and Indrajit Ray), *Data and Applications Security XVII: Status and Prospects*, July 2004.
- Editor (with Vijay Atluri), *Journal on Digital Libraries*, Special Issue on Security, Volume 4, Number 3, 2004.
- Editor (with David Ferraiolo), *ACM Symposium on Access Control Models and Technologies*, June 2006.
- Editor, *ACM Transactions on Information and System Security*, Special Issue, Volume 11, Number 1, 2008.
- Editor (with Ninghui Li), *ACM Symposium on Access Control Models and Technologies*, June 2008.
- Editor (with Guojun Wang, Dengguo Feng, Muttukrishnan Rajarajan), *International Symposium on Cyberspace Safety and Security*, November 2013.
- Editor (with Aditya Bagchi), *International Conference on Information Systems and Security*, December 2013.
- Editor (with Guojun Wang, Jose M. Alcaraz Calero, and Sabu M. Thampi), *International Conference on Security, Privacy, and Anonymity in Computation, Communication, and Storage*, November 2016.
- Editor (with Pierangela Samarati and Indrajit Ray), *From Database to Cyber Security – Essays Dedicated to Sushil Jajodia on the Occasion of His 70th Birthday*, 2018.

Contracts and Grants

Funded Projects as PI

- Indrakshi Ray, “Protecting Cyber Physical Systems using NIST Next Generation Access Control”, National Institute of Standards and Technology, 08/23 – 08/26, \$249,492.
- Indrakshi Ray and Indrajit Ray, “NSF IUCRC Center for Cybersecurity Analytics and Automation Phase II”, National Science Foundation, 03/19 – 02/25, \$500,000.
- Indrakshi Ray and Indrajit Ray, “NSF IUCRC Center for Cybersecurity Analytics and Automation Phase II”, Research Experience for Undergraduate Supplement, National Science Foundation, 6/18– 05/19, \$16,000.
- Indrakshi Ray and Indrajit Ray, “NSF IUCRC Center for Cybersecurity Analytics and Automation Phase II”, American Megatrends Inc., \$100,000, 05/20 – 02/25.
- Indrakshi Ray, “NSF IUCRC Center for Cybersecurity Analytics and Automation Phase II”, NIST, \$150,000, 03/19 – 02/25.
- Indrakshi Ray, “NSF IUCRC Center for Cybersecurity Analytics and Automation Phase II”, ARL, \$100,000, 08/21 – 02/25.
- Indrakshi Ray, “NSF IUCRC Center for Cybersecurity Analytics and Automation Phase II”, Cyber Risk Research, \$150,000, 09/20 – 02/25.
- Indrakshi Ray, “NSF IUCRC Center for Cybersecurity Analytics and Automation Phase II”, Statnett, Norway, \$150,000, 09/20 – 02/25.
- Indrakshi Ray, Rosa Martey, and Benjamin Clegg, “Human Assisted Cyber Reasoning Systems”, \$165,077, 08/23 – 05/24.
- Indrakshi Ray, “Cybersecurity Camp for High School Girls”, College of Natural Science and Computer Science Department, \$15,000, 03/23 – 06/23.
- Indrakshi Ray and Sudipto Ghosh, “COVID-19: RAPID: Ensuring Integrity of COVID-19 Data and News Across Regions”, 5/20 – 04/22, \$199,748.
- Indrakshi Ray, “Attribute-Based Access Control for Secure Internet of Things”, National Institute of Standards and Technology, 08/18 – 08/21, \$199,905.
- Indrakshi Ray, “SaTC: CORE: Small: Collaborative: GOALI: Detecting and Reconstructing Network Anomalies and Intrusions in Heavy Duty Vehicles, National Science Foundation, 8/17 – 7/22, \$275,701 (CSU Budget). (Lead Institute: University of Tulsa, PI: Jeremy Daily, \$256,000 (U Tulsa Budget)
- Indrakshi Ray and Indrajit Ray, “Colorado State University Site Addition: IUCRC Center for Configuration Analytics and Automation”, National Science Foundation, 02/17 - 02/19, \$299,956.
- Indrakshi Ray, “Colorado State University Site Addition: IUCRC Center for Configuration Analytics and Automation”, Air Force Research Laboratory, 02/17 - 02/19, \$46,555.
- Indrakshi Ray and Indrajit Ray, “Colorado State University Site Addition: IUCRC Center for Configuration Analytics and Automation”, CableLabs, 02/17 - 02/19, \$100,000.
- Indrakshi Ray, “Colorado State University Site Addition: IUCRC Center for Configuration Analytics and Automation”, SecureNok, Norway, 02/17 - 02/19, \$100,000.
- Indrakshi Ray and V. Chandrasekar, “Colorado State University Site Addition: IUCRC Center for Configuration Analytics and Automation”, Furuno Electric Company, Japan, 02/17 - 02/19, \$100,000.
- Indrakshi Ray, “EAGER: Collaborative: Toward a Test Bed for Heavy Vehicle Cyber Security Experimentation”, Research Experience for Undergraduate Supplement, National Science Foundation, 1/17– 12/18, \$16,000.
- Indrakshi Ray, “EAGER: Collaborative: Toward a Test Bed for Heavy Vehicle Cyber Security Experimentation”, National Science Foundation, 1/16– 12/18, \$129,999 (CSU Budget). (Lead Institute: University of Tulsa, PIs: Rosanne Gamble and Jeremy Daily \$186,000 (UTulsa Budget).
- Indrakshi Ray, “Health Information Protection using Attribute Based Access Control”, National Institute of Standards, 08/16–07/19, \$150,858.

Indrakshi Ray, “Privacy Preserving Data Sharing: Data Science to Patient Value Initiative”, University of Colorado Denver, 08/17–12/18, \$15,473.

Indrakshi Ray, “Secure Communication and Access Control in Isolated Runtime Linux Environments”, National Institute of Standards, 08/16–08/17, \$80,094.

Indrakshi Ray and Sudipto Ghosh, “ETL Testing in Data Warehouses”, University of Colorado Denver, 08/16-12/17, \$57,551.

Indrakshi Ray and Indrajit Ray, “Privacy Preserving Record Linkage in Federated Databases”, University of Colorado Denver, 08/16-08/17, \$39,620.

Indrakshi Ray, Indrajit Ray, and Christos Papadopoulos, “Planning Grant: IUCRC for Joining Center for Configuration Analytics and Automation”, National Science Foundation, 08/15–07/16, \$14,500.

Indrakshi Ray, “Access Control Management in Linux Environments”, National Institute of Standards, 08/15–07/16, \$74,702.

Indrakshi Ray, “SHF: Small: Scenario-Based Validation of Design Models”, National Science Foundation, (managed after the demise of my colleague Dr. Robert France), 03/14–07/15, \$516,044.

Indrakshi Ray, “Privacy Preserving Information Disclosure in Social Networks”, National Institute of Standards, 06/14–05/15, \$34,956.

Indrakshi Ray, “Toward Automated Policy Compliance Checking for Health Databases”, Colorado State University Internal Grant, 01/15–06/15, \$12,000.

Indrakshi Ray and Indrajit Ray, “Addressing Security Challenges in Pervasive Computing Applications”, Air Force Office of Scientific Research, 12/06–05/10, \$467,952.

Indrakshi Ray and Robert France, “Specification, Analysis, Integration and Evolution of Security Policies using Aspects”, Air Force Office of Scientific Research, 02/04 – 02/07, \$300,024.

Indrakshi Ray and Indrajit Ray, “Designing Fail-Soft E-commerce Protocols Using Formal Methods”, Summer Research Grant, University of Michigan-Dearborn, 2000, \$5000.

Indrakshi Ray, Indrajit Ray and Bruce Maxim, “Design and Verification of Secure E-Commerce Protocol”, Faculty Research Grant, University of Michigan-Dearborn, 1999, \$1,700.

Funded Projects as Co-PI

Ritwik Banerjee and Indrakshi Ray, “EAGER: MedAN: A Framework for Investigating Live Medical Data against Privacy Laws”, National Science Foundation, 10/23 – 09/25, \$250,000 (CSU portion \$124,943).

Benjamin A. Clegg and Indrakshi Ray, “Human-Assisted Cyber Reasoning Systems and Oppositional Human Factors”, Department of Defense, 07/21 – 01/23, \$234,001.

Piotr S. Kokozka, Indrakshi Ray, and Haonan Wang, “ATD: Threat Detection Based on Simultaneous Monitoring of Complex Signals from Multiple Sources”, National Science Foundation, 09/21 – 08/24, \$275,798.

Jean Peccoud and Indrakshi Ray, “EAGER: Development of a Tool Chain to Write and Read Self-documenting Plasmids”, National Science Foundation, 08/19 –07/21, \$300,000.

Sudipto Ghosh and Indrakshi Ray, “Improving Efficiency and Effectiveness of ETL Testing in Data Warehouses”, University of Colorado Denver, 01/18-06/19, \$80,100.

Jean Peccoud, Ashley Anderson, Michael Carolan, Raymond Goodrich, Indrakshi Ray, Zac Rogers, Ron Sega, Randall Murch, Nicolas Dunaway, and Ryan Burnett, “Catalyst for Innovative Partners: Center for Cyber-Biosecurity”, Office of Vice President on Research, Colorado State University, 01/18 – 12/18, \$100,000.

Indrajit Ray, Toan Ong, Indrakshi Ray, Michael Kahn, and Arthur Davidson, “Novel Protocols for Anonymous Patient Deduplication in Regional Data Networks for Accurate Cohort Identification”, Colorado Clinical and Translational Sciences Institute, 08/17 – 5/18, \$60,000.

V. Chandrasekar, Chris Kummerow, José Chávez, Margaret Cheney, Neil Grigg, Thomas Holtzer, Steve Miller, Jorge Ramirez, Indrakshi Ray, Steven Reising, Steve Rutledge, Russ Schumacher, and Sue van den Heever, “Partnership for End-to-End Active Remote Sensing Solutions for Agriculture, Water, Weather and Climate”, PRECIP program, Colorado State University, 04/16 – 12/16, \$5,000.

Geri Georg and Indrakshi Ray, “Development of ID Source for First Release”, United States Department of Agriculture, 08/09 – 08/10, \$36,749.

Indrajit Ray and Indrakshi Ray, “A Framework for Secure and Survivable Transaction Processing”, National Science Foundation, 06/03 – 05/06, \$152,228.

Indrajit Ray and Indrakshi Ray, “A Model of Trust for Developing Trustworthy Systems from Untrustworthy Actors”, Air Force Research Laboratory, 05/03 – 05/06, \$318,498.

Indrajit Ray, Indrakshi Ray, Kiumi Akingbehin, Bruce Maxim, and Qiang Zhu, “Acquisition of Instruments for Research in Computer and Network Security”, National Science Foundation, Major Research Instrumentation, 09/99–08/01, \$157,937.

Bruce Maxim, Ken Modesitt, Indrakshi Ray and Indrajit Ray, “High Resolution Portable Multimedia”, Chancellor’s Technology Grant, University of Michigan-Dearborn, 1998, \$1,000.

Funded Projects as Senior Personnel

James Bieman, Lars Eisen (contact), Sudipto Ghosh, Saul Lozano-Fuentes, “Use of cell phones for field data capture in a Dengue Decision Support System”, National Institute of Health, 07/2009 – 07/2011, \$365,971.

Gift Funding for Secure IoT Laboratory

CableLabs, \$10,000, 2017.

CableLabs, \$50,000, 2019.

Invited Talks at Institutions

1. 1997 *Using Formal Methods for Semantics-Based Decomposition of Transactions*, Oakland University, Rochester, MI.
2. 1997 *Using Formal Methods for Semantics-Based Decomposition of Transactions*, University of Michigan–Dearborn, Dearborn, MI.
3. 2000 *Designing Failure-Resilient E-Commerce Protocol Using Model Checking*, Georgia State University, Atlanta, GA.
4. 2000 *Designing Failure-Resilient E-Commerce Protocol Using Model Checking*, Colorado State University, Fort Collins, CO.
5. 2001 *Designing Failure-Resilient E-Commerce Protocol Using Model Checking*, University of Texas at Arlington, Arlington, TX.
6. 2001 *Designing Failure-Resilient E-Commerce Protocol Using Model Checking*, Washington State University, Pullman, WA.
7. 2001 *Designing Failure-Resilient E-Commerce Protocol Using Model Checking*, University of Maryland Baltimore County, Baltimore, MD.
8. 2004 *An Anonymous Fair-Exchange E-Commerce Protocol*, IBM Boulder, Boulder, CO.
9. 2004 *An Anonymous Fair-Exchange E-Commerce Protocol*, Purdue University, West Lafayette, IN.
10. 2006 *An Aspect-Based Approach for Developing Secure Applications*, Invited Talk at Hogeschool Utrecht, Utrecht, The Netherlands.
11. 2006, *An Anonymous Fair-Exchange E-Commerce Protocol*, Invited Talk at University of Pittsburgh, Pittsburgh, PA.
12. 2009 *Information Security Research at Colorado State University*, PSG Tech, Coimbatore, India.
13. 2010 *Computer Science Research at Colorado State University*, Jadavpur University, Kolkata, India.
14. 2010 *Computer Science Research at Colorado State University*, Bengal Engineering and Science University, Kolkata, India.
15. 2015 *Stream Processing with Information Flow Constraints*, Lancaster University, Lancaster, U.K.
16. 2017 *Access Control across Isolated Containerized Environments in Linux*, University of Connecticut, CT.
17. 2017 *Attribute-Based Access Control for Health Care Applications*, Ford Motor Company, Dearborn, MI.
18. 2017 *Access Control across Isolated Containerized Environments in Linux*, Concordia University, Canada.
19. 2017 *Tracing the Trajectory of Access Control Model in the New Cyber World*, University of Calgary, Canada.
20. 2017 *Tracing the Trajectory of Access Control Model in the New Cyber World*, Colorado School of Mines, CO.
21. 2018 *Secure IoT Research*, Dish Network, CO.
22. 2019 *InComVecSec: On Understanding and Formalizing Attacks in Embedded Networks in Commercial Heavy Vehicles*, University of Colorado, Boulder.
23. 2019 *Tracing the Trajectory of Access Control Models in the New Cyber World*, University of Maryland Baltimore County, Baltimore, Maryland.
24. 2019 *InComVecSec: On Understanding and Formalizing Attacks in Embedded Networks in Commercial Heavy Vehicles*, University of North Carolina Charlotte.
25. 2020 *Tracing the Trajectory of Access Control Models in the New Cyber World*, Case Western Reserve University.
26. 2020 *Anomaly Detection and Explanation in Big Data*, Concordia University.
27. 2021 *Cybersecurity of Embedded Networks in Heavy Vehicles*, Colorado School of Mines.
28. 2021 *Cybersecurity of Embedded Networks in Heavy Vehicles*, University of North Carolina at Charlotte.
29. 2022 *Tracing the Trajectory of Access Control Models in the New Cyber World*, Amrita University, India.

30. 2023 *Know Thy Site: Fake or Genuine?*, The MITRE Corporation, McClean, Virginia.
31. 2023 *Synopsis of Research Projects at Colorado State University*, NTNU, Norway.
32. 2023 *Research Challenges in Socio Cyber Physical Systems*, Statkraft, Norway.

Panel Presentations

1. 2003 *Grand Challenges in Integrity and Data Quality*, Annual IFIP WG 11.5 Conference on Integrity and Internal Control in Information Systems, Panelist, Lausanne, Switzerland.
2. 2016 *Panel on Attribute-Based Access Control*, ACM Workshop on Attribute Based Access Control, New Orleans, Louisiana.
3. 2016 *Specification and Analysis of Cyber Physical Systems: An Academic Perspective*, Secure Cyber Physical Systems Week Think-in Session, Singapore.
4. 2020 *Panel: Being a Grad Student – How to Succeed and Plant the Seeds for your Future Career*, Individualized Cybersecurity Research Mentoring (iMentor) Workshop (co-located with ACM Conference on Computer and Communications Security), November 2020.
5. 2020 *Plenary Panel: Collaborative Intelligence and Killer Applications in Edge Computing*, IEEE International Conference on Collaboration and Internet Computing, December 2020.
6. 2022 *Security and Privacy for Emerging IoT and CPS Domains*, ACM Conference on Data and Application Security, Panelist, Baltimore, MD.
7. 2023 *Research Challenges in Cyberbiosecurity*, Translational Talks, Translational Medical Institute, Colorado State University.
8. 2023 *Panel Discussion on Women in Cybersecurity*, International Conference on Secure Knowledge Management, Panelist, Tempe, AZ.

Presentations at AFRL/AFOSR/DHS/NSF Meetings

1. 2004 *An Aspect-Based Approach for Specification, Validation, Integration and Evolution of Security Policies*, AFOSR PI Meeting, Ithaca, NY.
2. 2005 *Specification, Analysis, Integration and Evolution of Security Policies using Aspects*, AFOSR PI Meeting, Rome, NY.
3. 2006 *An Aspect-Based Approach for Specification, Analysis, Integration and Evolution of Security Policies*, AFOSR PI Meeting, Verona, NY.
4. 2006 *An Aspect-Oriented Risk-Driven Development of Critical Applications*, National Workshop on High-Confidence Software Platforms for Cyber-Physical Systems, Alexandria, VA.
5. 2007 *Addressing Security Challenges in Pervasive Computing Applications*, AFOSR PI meeting, Rome, New York.
6. 2007 *A Framework for Developing Secure Systems*, Cyber Defense Conference, Rome, New York.
7. 2008 *Addressing Security Challenges in Pervasive Computing Applications*, AFOSR PI meeting, Arlington, VA.
8. 2008 *Security Provisioning in Pervasive Environments Using Multi-Objective Optimizations*, Cyber Defense Conference, Rome, New York.
9. 2009 *Challenges in Securing Pervasive Computing Applications*, NSF Workshop on Data and Applications Security, Arlington, VA.
10. 2009 *Addressing Security Challenges in Pervasive Computing Applications*, AFOSR PI meeting, Arlington, VA.
11. 2009 *Access Control Challenges for Cyber-Physical Systems*, DHS: S&T Workshop on Future Directions in Cyber-physical Systems Security, Newark, New Jersey.

12. 2012 *Query Plan Execution in a Heterogeneous Stream Management System for Situational Awareness*, Air Force Research Laboratory, Rome, NY.
13. 2013 *Secure Real-Time Auditing in the Clouds*, Air Force Research Laboratory, Rome, NY.
14. 2014 *Secure Complex Event Processing in a Heterogeneous and Dynamic Network*, SPIE Ground/Air Multisensor Interoperability, Integration, and Networking for Persistent ISR, Baltimore, MD.
15. 2014 *Information Security Research at Colorado State University*, Industrial Advisory Board Meeting Center for Configuration Analytics and Automation, Charlotte, NC.
16. 2015 *Information Security Research at Colorado State University*, Industrial Advisory Board Meeting Center for Configuration Analytics and Automation, Fairfax, VA.
17. 2015 *Information Security Research at Colorado State University*, Industrial Advisory Board Meeting Center for Configuration Analytics and Automation, Charlotte, NC.
18. 2016 *Projects in Planning Grant Workshop* Potential Industrial Advisory Board Meeting Center for Configuration Analytics and Automation, Fort Collins, CO.
19. 2017 *Project Presentations* Potential Industrial Advisory Board Meeting Center for Configuration Analytics and Automation, Fort Collins, CO.
20. 2018 *Project Presentations* Industrial Advisory Board Meeting Center for Cybersecurity Analytics and Automation, Charlotte, NC.
21. 2020 *Project Presentations* Industrial Advisory Board Meeting Center for Cybersecurity Analytics and Automation, online.
22. 2021 *Project Presentations* Industrial Advisory Board Meeting Center for Cybersecurity Analytics and Automation, online.
23. 2022 *Project Presentations* Industrial Advisory Board Meeting Center for Cybersecurity Analytics and Automation, online.
24. 2022 *Project Presentations* Industrial Advisory Board Meeting Center for Cybersecurity Analytics and Automation, Charlotte, NC.
25. 2023 *Project Presentations* Industrial Advisory Board Meeting Center for Cybersecurity Analytics and Automation, Fairfax, VA.

Conference and Workshop Presentations

1. 1996 *Ensuring Atomicity of Multilevel Transactions*, IEEE Symposium on Security and Privacy, Oakland, CA.
2. 2001 *Failure Analysis of an E-Commerce Protocol using Model Checking*, International Workshop on Advanced Issues of E-Commerce and Web-based Information Systems, San Jose, CA.
3. 2001 *An Anonymous Fair-Exchange E-Commerce Protocol*, International Workshop on Internet Computing and E-Commerce, San Francisco, CA.
4. 2001 *Using Compatible Keys for Secure Multicasting in E-Commerce*, International Workshop on Internet Computing and E-Commerce, Fort Lauderdale, FL.
5. 2002 *Designing High Integrity Systems Using Aspects*, Annual IFIP WG 11.5 Conference on Integrity and Internal Control in Information Systems, Bonn, Germany.
6. 2003 *Multi-level Secure Rules and Its Impact on the Design of Active Databases*, British National Conference on Databases, Coventry, U.K.
7. 2003 *Concurrent and Real-Time Update of Access Control Policies*, International Conference on Databases and Expert Systems, Prague, Czech Republic.
8. 2003 *Using Parameterized UML to Specify and Compose Access Control Models*, Annual IFIP WG 11.5 Conference on Integrity and Internal Control in Information Systems, Lausanne, Switzerland.

9. 2004 *Concurrency Control in Mobile Database Systems*, International Conference on Advanced Networking and Applications, Fukuoka, Japan.
10. 2004 *Using UML to Visualize Role-Based Access Control Constraints*, ACM Symposium on Access Control Models and Technologies, Yorktown Heights, NY.
11. 2004 *Reducing Damage Assessment Latency in Survivable Databases*, British National Conference on Databases, Edinburgh, Scotland.
12. 2004 *Implementing Real-Time Update of Access Control Policies*, Annual IFIP WG 11.3 Conference on Data and Applications Security, Sitges, Spain.
13. 2004 *Ensuring Task Dependencies During Workflow Recovery*, International Conference on Database and Expert Systems, Zaragoza, Spain.
14. 2004 *Using Schemas to Simplify Access Control for XML Documents*, International Conference on Distributed Computing and Internet Technologies, Bhubaneswar, India.
15. 2005 *Relational Database Operations Modeling with UML*, IEEE International Conference on Advanced Information Networking and Applications, Taipei, Taiwan.
16. 2005 *Detecting Dependency Conflicts in Advanced Transaction Models*, International Database Engineering and Applications Symposium, Montreal, Canada.
17. 2005 *Recovering from Malicious Attacks in Workflow Systems*, International Conference on Database and Expert Systems, Copenhagen, Denmark.
18. 2005 *Towards a Location-Aware Role-Based Access Control Model*, IEEE Conference on Security and Privacy for Emerging Areas in Communication Networks, Athens, Greece.
19. 2005 *Event Detection in Multilevel Secure Active Databases*, International Conference on Information Systems Security, Kolkata, India.
20. 2005 *Validation of Policy Integration using Alloy*, International Conference on Distributed Computing and Internet Technologies, Bhubaneswar, India.
21. 2006 *On the Completion of Workflows*, International Conference on Database and Expert Systems Applications, Krakow, Poland.
22. 2006 *LRBAC: A Location-Aware Role-Based Access Control Model*, International Conference on Information Systems Security, Kolkata, India.
23. 2006 *An Aspect-Based Approach for Specification, Analysis, Integration and Evolution of Security Policies, Keynote Talk*, International Conference on Advanced Computing and Communications, Mangalore, India.
24. 2007 *A Method for Early Correspondence Detection Using Instance Data*, International Conference on Enterprise Information Systems, Funchal, Portugal.
25. 2008 *Optimizing On-Demand Data Broadcast Scheduling in Pervasive Environments*, International Conference on Extending Database Technology, Nantes, France.
26. 2008 *On the Formal Analysis of a Spatio-Temporal Role-Based Access Control Model*, IFIP WG 11.3 Conference on Data and Applications Security, London, U.K.
27. 2008 *Securing Pervasive Computing Applications, Keynote Talk*, International Symposium on Trusted Computing, Zhangjiajie, China.
28. 2009 *Access Control in Computing Systems*, Invited Talk at Information Security Education and Awareness Workshop, Guwahati, India.
29. 2009 *Ensuring Spatio-Temporal Access Control for Real-World Applications*, ACM Symposium on Access Control Models and Technologies, Stresa, Italy.
30. 2009 *Towards Trustworthy Delegation in Role-Based Access Control Model*, Information Security Conference, Pisa, Italy.
31. 2011 *Multilevel Secure Data Stream Processing*, IFIP WG 11.3 Working Conference on Data and Applications Security, Richmond, VA.

32. 2013 *Specification and Analysis of Access Control Policies for Mobile Applications*, ACM Symposium on Access Control Models and Technologies, Amsterdam, The Netherlands.
33. 2013 *Information Flow Control for Stream Processing in the Clouds*, ACM Symposium on Access Control Models and Technologies, Amsterdam, The Netherlands.
34. 2013 *Distributed Multilevel Secure Data Stream Processing*, International Workshop on Assurance in Distributed Systems and Networks, Philadelphia, PA.
35. 2015 *Stream Processing with Information Flow Constraints*, IFIP WG 11.3 Working Conference on Data and Applications Security, Fairfax, VA.
36. 2015 *Towards Efficient Dissemination and Filtering of XML Data Streams*, International Conference on Dependable, Autonomic, and Secure Computing, Liverpool, U.K.
37. 2015 *Modeling of Online Social Network Policies using Attribute-Based Access Control Framework*, International Conference on Information Systems Security, Kolkata, India.
38. 2016 *Applying Attribute-Based Access Control to Privacy Preserving Health Care Data Disclosure*, International Conference on Biomedical and Health Informatics, Las Vegas, Nevada.
39. 2016 *Specification and Enforcement of Location Aware Attribute-Based Access Control for Online Social Networks*, ACM Workshop on Attribute Based Access Control, New Orleans, Louisiana.
40. 2016 *Privacy Preserving Probabilistic Record Linkage Using Locality Sensitive Hashes*, WG 11.3 Working Conference on Data and Applications Security and Privacy, Trento, Italy.
41. 2016 *Towards Access Control for Isolated Applications*, International Conference on Security and Cryptography, Lisbon, Portugal.
42. 2016 *Attribute-Based Access Control: Status and Prospects, Keynote Talk*, International Conference on Security and Cryptography, Lisbon, Portugal.
43. 2016 *Attribute-Based Access Control: Status and Prospects, Keynote Talk*, International Conference on Security, Privacy, and Anonymity in Computation, Communication, and Storage, Zhangjiajie, China.
44. 2017 *Attribute-Based Access Control for Health Care Resources*, ACM Workshop on Attribute Based Access Control, Scottsdale, Arizona.
45. 2017 *Using Attribute-Based Access Control for Remote Healthcare Monitoring*, International Conference on Software Defined Systems, Valencia, Spain.
46. 2017 *Tracing the Trajectory of Access Control Model in the New Cyber World, Keynote Talk*, Central Area Networking and Security Workshop, Rolla, Missouri.
47. 2018 *Securing Home IoT Environments with Attribute-Based Access Control*, ACM Workshop on Attribute-Based Access Control, Tempe, Arizona.
48. 2018 *Tracing the Trajectory of Access Control Model in the New Cyber World*, Workshop on Women in Cybersecurity Research, Trivandrum, India. (Remote Presentation)
49. 2018 *An Efficient Implementation of Next Generation Access Control for the Mobile Health Cloud*, International Conference on Fog and Mobile Edge Computing, Barcelona, Spain.
50. 2018 *Towards Service Orchestration in XML Filtering Overlays*, New Trends in Database and Information Systems, Budapest, Hungary.
51. 2018 *On Sybil Classification in Online Social Networks Using Only Structural Features*, Annual Conference on Privacy, Security, and Trust, Belfast, Ireland.
52. 2018 *Privacy Preserving Record Linkage without Trusted Third Party*, Annual Conference on Privacy, Security, and Trust, Belfast, Ireland.
53. 2019 *Using Machine Learning to Detect Anomalies in Embedded Networks in Heavy Vehicles*, International Symposium on Foundations & Practice of Security, Toulouse, France.
54. 2021 *Cybersecurity of Embedded Networks in Heavy Vehicles*, ShaktiCon, Virtual.
55. 2023 *Phishing Detection: Challenges and Solutions*, Shakticon, Virtual.

56. 2023 *Phishing Detection: Challenges and Solutions*, International Conference on Next Generation Computing Systems, Coimbatore, India.
57. 2023 *Synthesizing and Analyzing Attribute-Based Access Control Model Generated from Natural Language Policy Statements*, Symposium on Access Control Models and Technologies, Trento Italy.
58. 2023 *Cybersecurity of Embedded Networks in Heavy Vehicles*, International Conference on Emerging Trends in Networks and Computer Communications, Windhoek, Namibia.
59. 2023 *Model Based Risk Assessment and Risk Mitigation Framework for Cyber-Physical Systems*, International Conference on Trust, Privacy, and Security in Intelligent Systems, and Applications, Atlanta, GA.
60. 2023 *A Small World – Privacy Preserving IoT Device-Type Fingerprinting with Small Datasets*, International Symposium on Foundations and Practice of Security, Bordeaux, France.

Professional Affiliations and Activities

Professional Affiliations ACM (Senior), ACM SIGSAC, IFIP WG 11.3, UPE, IEEE (Senior)

Editorship Associate Editor, IEEE Transactions on Services Computing, 2017 – present.

Associate Editor, IEEE S& P, 2018 – present.

Associate Editor, IEEE Transactions on Secure and Dependable Computing, 2014 – 2018.

Editorial Board Member, Scientific Reports, 2021 – present.

Editorial Board Member, International Journal of Information Security, 2021 – present.

Editorial Board Member, Computer Standards and Interfaces, Elsevier, 2005 – present.

Editor (with Vijayalakshmi Atluri), Special Issue on Security, Journal on Digital Libraries, Springer-Verlag, Volume 4, Number 3, November 2004.

Editor, Special Issue, ACM Transactions on Information and System Security, Volume 11, Number 1, February 2008.

Editor (with Javier Lopez, Sokratis Katsikas, Jianying Zhou), Special Issue on Security of Cyberphysical Systems and Industrial Control Systems and Networks, Security and Communication Networks, Hindawi, (To appear)

Conference/Workshop Chair Program Co-Chair, IEEE Conference on Communications and Network Security, Taipei, Taiwan, 2024.

Program Co-Chair, 3rd International Conference on Emerging Trends in Networks and Computer Communications, Windhoek, Namibia, 2023.

Program Co-Chair, 5th International Conference on Cognitive Machine Intelligence, Atlanta, Georgia, 2023.

Program Co-Chair, 8th International Conference on Collaboration and Internet Computing, Virtual, 2022.

Program Co-Chair, 3rd International Conference on Trust, Privacy and Security in Intelligent Systems and Applications, Atlanta, Georgia, 2021.

Program Co-Chair, 5th International Conference on Software Defined Systems, Rome, Italy, 2019.

Program Co-Chair, International Conference on Advanced and Trusted Computing, Guangzhou, China, 2018.

Program Co-Chair, 9th International Conference on Security, Privacy, and Anonymity in Computation, Communication and Storage, Zhangjiajie, China, November 2016.

Program Co-Chair, 9th International Conference on Information Systems Security, Kolkata, India, December 2013.

Program Co-Chair, The 5th International Symposium on Cyberspace Safety and Security, Zhangjiajie, China, November 2013.

Program Co-Chair, The 3rd International Symposium on Security and Privacy in Internet of Things, Melbourne, Australia, July 2013.

Program Co-Chair, The 1st International Workshop on Cloud Security Auditing (in association with the 9th IEEE World Congress on Services), July 2013.

Program Co-Chair, The 2nd International Symposium on Security and Privacy in Internet of Things, Liverpool, U.K., June 2012.

Program Co-Chair, The IEEE/IFIP International Symposium on Trust, Security and Privacy for Pervasive Applications, Shanghai, China, December 2008.

General Chair, 13th ACM Symposium on Access Control Models and Technologies, Estes Park, CO, June 2008.

Program Chair, 11th ACM Symposium on Access Control Models and Technologies, Lake Tahoe, CA, June 2006.

Program Co-Chair, 14th International Conference on Advanced Computing and Communications, Mangalore, India, December 2006.

Program Co-Chair, IEEE International Workshop on Trusted and Autonomic Computing Systems, Vienna, Austria, April 2006.

Program Co-Chair, 17th Conference on IFIP WG 11.3 on Data and Applications Security, Estes Park, CO, August 2003.

Track Chair 17th Annual Conference on Privacy, Security, and Trust, Fredericton, Canada, August 2019.

The 4th International Conference on Future Internet of Things and Cloud, Vienna, Austria, August 2016.

The 8th International Conference on Mobile Web Information Systems, Niagara Falls, Canada, September 2011, 2012.

The IEEE 23rd International Conference on Advanced Information Networking and Applications, Bradford, U.K., May 2009.

International Conference on Distributed Computing and Internet Technology, Bhubaneswar, India, December 2004.

Steering Committee Member ACM Symposium on Access Control Models and Technologies (SACMAT) 2008–2017.

International Liaison Chair Third International Conference on Autonomic and Trusted Computing, Wuhan and Three Gorges, China, September 2006.

Program Committee Member ACM Conference on Computer and Communications Security (CCS), 2023 – 2024.

ACM Conference on Data and Application Security and Privacy (CODASPY) 2021 – 2024.

European Symposium on Research in Computer Security (ESORICS), 2024.

Australasian Conference on Information Security and Privacy (ACISP) 2021 – 23.

Workshop on Privacy in Electronic Society (WPES) 2018, 2022, 2023.

Symposium on Vehicle Security and Privacy (VehicleSec), 2023-2024.

International Symposium on Stabilization, Safety, and Security of Distributed Systems (SSS) 2023.

International Workshop on Re-design Industrial Control Systems with Security (RICSS) 2023.

IEEE International Conference on Cognitive Machine Intelligence (IEEE CogMI) 2020.

IEEE Conference on Communications and Network Security (CNS) 2020 – 2023.

ACM Symposium on Access Control Models and Technologies (SACMAT) 2004 – 2023.

WG 11.3 Working Conference on Data and Applications Security (DBSec) 2004 – 2023.

IEEE International Conference on Trust, Security and Privacy in Intelligent Systems and Applications (IEEE TPS) 2020, 2023.

ACM Cyber-Physical System Security Workshop (CPSS) 2017 – 2022.

International Conference on Security and Cryptography (SECRYPT) 2006 – 2009, 2018, 2020, 2021.

The Web Conference (WWW) (Security, Privacy, and Trust) 2019, 2021.

International Conference on Distributed Computing Systems (ICDCS) 2021.

International Conference on Information Systems Security (ICISS) 2005 – 2016, 2018, 2020 - 2022.

Secure Knowledge Management Workshop (SKM) 2017, 2021.

Workshop on the Security of Industrial Control Systems and Cyber-Physical Systems (CyberICPS) 2020 – 2021.

Workshop on Cloud Security & Privacy (Cloud S&P) 2020.

Cyber Security Symposium (Cybersec) 2020.

ACM Workshop on Automotive Security (AutoSec) 2019, 2021, 2022.

International Conference on Privacy, Security, and Trust (PST) 2017 – 2018, 2022.

ACM/IEEE International Conference on Formal Methods and Models for System Design (MEMOCODE) 2016-2018.

Workshop on Attribute-Based Access Control (ABAC) 2016-2018.

International Symposium on Foundations and Practice of Security (FPS) 2017 – 2018.

International Conference on Availability, Reliability and Security (ARES) 2018.

Workshop on Security Engineering for Cloud Computing (IWSECC) 2018.

Very Large Data Bases Conference (VLDB) 2017.

Information Security Conference (ISC) 2017.

International Symposium on High Assurance Systems Engineering (HASE) 2017.

WG 11 International Conference on Information Security and Privacy (SEC) 2014 – 2016.

International Conference on Distributed Computing Systems (ICDCS) (Security and Privacy) 2014.

European Symposium on Research in Computer Security (ESORICS) 2008, 2011 – 2014.

International Conference on Network and System Security (NSS) 2009 – 2015.

International Symposium on Security in Collaboration Technology and Systems (SECOTS) 2012, 2014.

International Workshop on Security in Information Systems (WOSIS) 2005 – 2015.

International Workshop on Assurance in Distributed Systems and Network (ADSN) 2014.

ACM International Conference on Distributed Event-Based Systems (DEBS) (Poster and Demo Track) 2013.

IEEE International Conference on e-Business Engineering (ICEBE) (Software Engineering for e-Business) 2013 – 2014.

International Workshop on Information Systems Security Engineering (WISSE) 2012 – 2013.

International Conference on Mobile Web Information Systems (MobiWIS) 2013.

Workshop on Redefining and Integrating Security Engineering (RISE) 2012.

International Workshop on Risk and Trust in Safety Critical Systems (RTW) 2012.

International Conference on Collaborative Computing: Networking, Applications and Worksharing (CollaborateComm) 2010 - 2011.

ACM GIS International Workshop on Security and Privacy in GIS and LBS (SPRINGL), 2010.

International Workshop on Privacy and Anonymity in the Information Society (PAIS) 2009 – 2011.

Information Security Conference (ISC) 2009.

International Conference on Data Engineering (ICDE) 2008.

International Workshop on Adaptive Systems in Heterogeneous Environments (ASHEs) 2008 – 2010.

International Conference on Database Systems for Advanced Applications (DASFAA) 2007 –2008.

IEEE International Conference on Advanced Information Networking and Applications (AINA) 2006 – 2008.

International Conference on Intelligent Pervasive Computing (IPC) 2007.

International Workshop on Mobile and Ubiquitous Context Aware Systems and Applications (MUBICA) 2007.

International Conference on Self-Organization and Autonomous Systems in Computing and Communications (SOAS) 2007.

International Conference on E-commerce and Web Technologies (EC-Web) 2003 – 2008.

International Workshop on Self-Adaptive and Autonomic Systems (SAACS) 2003 – 2007.

International Conference on Autonomic and Trusted Computing (ATC) 2008.

International Workshop on Secure Systems Methodologies Using Patterns (SPattern) 2007 – 2009.

IEEE International Conference on Information Reuse and Integration (IRI) 2006 – 2007.

Workshop on Trusted Collaboration (TrustCol) 2006.

International Symposium on Ubiquitous Intelligence and Smart Worlds (UISW) 2005.

International Conference on Distributed Computing and Internet Technology (ICDCIT) 2005.

ACM Conference on Computer and Communications Security (CCS) 2003 – 2004.
International Workshop on P2P Data Management, Security and Trust (PDMST) 2004.
Conference on Extending Database Technology (EDBT) 2004.
IFIP TC-11 WG 11.5 Working Conference on Integrity and Internal Control in Information Systems (IICIS) 2002 – 2004.
International Conference on Data Warehousing and Knowledge Discovery (DaWaK) 2003.
International Conference on Mobility in Databases and Distributed Systems (MDDS) 2003.
IEEE Conference on Electronic Commerce, (CEC) 2003.
Program Committee Member, Design Analysis and Simulation of Distributed Systems, Orlando, FL, March 2003.
International Conference on Security and Management (SAM) 2002.

Publications Chair Fourteenth International Symposium on Software Reliability Engineering (ISSRE) 2003.

Review Activities

Grants Panelist, National Science Foundation, 2002 – 2007, 2012, 2014 – 2023.

Reviewer, Air Force Office of Scientific Research, 2007 – 2009.

Reviewer, Army Research Office of Scientific Research, 2021.

Reviewer, Aides a La Formation Recherche, Luxembourg, 2010.

Journals ACM Transactions on Information and System Security

ACM Transactions on Internet Technology

IEE Proceedings Information Security

IEEE Transactions on Dependable and Secure Computing

IEEE Transactions on Knowledge and Data Engineering

IEEE Transactions on Mobile Computing

IEEE Transactions on Parallel and Distributed Systems

Distributed and Parallel Databases: An International Journal

International Journal of Cooperative Information Systems

Information Systems

Journal of Computer Security

Journal on Digital Libraries

Software and Systems Modeling Journal

University Service

AY 97–01: Member, Graduate Committee, CIS Department, University of Michigan – Dearborn.

AY 00–01: Member, Chair Search Committee, CIS Department, University of Michigan – Dearborn.

AY 01–02: Member, Undergraduate Committee, CS Department, Colorado State University.

AY 02–03: Member, Chair Search Committee, CS Department, Colorado State University.

AY 02–04: Member, Graduate Committee, CS Department, Colorado State University.

AY 04–05: Member, Undergraduate Committee, CS Department, Colorado State University.

AY 05–06: Member, Graduate Committee, CS Department, Colorado State University.

AY 07–08: Member, Faculty Search Committee, CS Department, Colorado State University.

AY 08–09: Member, Graduate Committee, CS Department, Colorado State University.

AY 02–04: Member, Graduate Committee, CS Department, Colorado State University.

AY 04–05: Member, Natural Sciences Learning Task Force Committee, College of Natural Sciences, Colorado State University.

AY 06: Member, Research Advisory Committee, Information Science & Technology Center, Colorado State University.

AY 06–07: Chair, Research Committee, CS Department, Colorado State University.

AY 08–09: Member, Graduate Committee, CS Department, Colorado State University.

AY 09–11: Chair, Graduate Recruitment Committee, CS Department, Colorado State University.

AY 11–12: Chair, Policy and Procedures Committee, CS Department, Colorado State University.

AY 12–14: Member, Graduate Recruitment Committee, CS Department, Colorado State University.

AY 10–14: Executive Committee Member, CS Department, Colorado State University.

AY 14–19: Diversity Committee Chair, CS Department, Colorado State University.

AY 17–19: Undergraduate Operations Committee, CS Department, Colorado State University.

AY 19–20: Outreach Committee, CS Department, Colorado State University.

AY 20–21: Outreach Committee, CS Department, Colorado State University.

AY 21–22: Search Chair, Faculty Recruitment Committee, CS Department, Colorado State University.

AY 22–23: Graduate Recruitment Committee, CS Department, Colorado State University.

AY 23–24: Faculty Search Chair, CS Department, Colorado State University.

AY 18–23: Cybersecurity Center Director, CS Department, Colorado State University.

AY 23–present: Cybersecurity Center Director, Colorado State University System.

Current Graduate Advisees

1. Mahmoud Abdelgawad Ph.D.
2. Saja Alqurashi Ph.D.
3. Shadaab Kawnain Bashir Ph.D.
4. Shwetha Gowdanakatte Ph.D.
5. Falebita Olutosin Ph.D.
6. Asif Uz Zaman Ph.D.
7. Evan Anspach M.S.
8. Andrei Bachinin M.S.
9. Maxwell Bar-On M.S.
10. Tomas Vasquez Barreto M.S.
11. Chandrima Ghatak M.S.
12. Eric Martin M.S.
13. Ethan Myers M.S.

Postdoc Advisees

1. Dr. Bruhadeshwar Bezawada 2017-2018.
2. Dr. Hossein Shirazi 2021 - 2022.
3. Dr. Ibrahim Lazrig 2023 - present.

Graduate Advisees (Completed)

1. Greg Turgeon, 2001, (M.S.) University of Michigan Dearborn
2. Nayot Poolsappasit, 2004, (M.S.) Colorado State University

3. Yajie Zhu, 2005, (M.S.) Colorado State University
4. Wei Huang, 2006, (M.S.) Colorado State University
5. Tai Xin, 2006, (Ph.D.) Colorado State University
6. Eunjee Song (Co-advisee, Advisor: Robert France, CSU), 2007, (Ph.D.) Colorado State University
7. Sudip Chakraborty (Co-advisee, Advisor: Indrajit Ray, CSU), 2008, (Ph.D.) Colorado State University
8. Mariappan Rajaram (Co-advisee, Advisor: Indrajit Ray, CSU), 2008, (M.S.) Colorado State University
9. Kyle Haefner, 2009 (M.S.) Colorado State University
10. Nayot Poolsappasit (Co-advisee, Advisor: Indrajit Ray, CSU), 2010, (Ph.D.) Colorado State University
11. Manachai Toahchoodee, 2010, (Ph.D.) Colorado State University
12. Kevin Burnett (Co-advisee, Advisor: Bruce Draper, CSU), 2012, (M.S.) Colorado State University
13. Ramadan Abdunabi, 2013, (Ph.D.) Colorado State University
14. Xing Xie, 2013, (Ph.D.) Colorado State University
15. Wuliang Sun, 2015, (Ph.D.) Colorado State University
16. Saksham Manchanda (Co-advisee, Advisor: Ross M. McConnell, CSU), 2016, (M.S.) Colorado State University
17. Negar M. Ghahfarokhi (Co-advisee, Advisor: Anura Jayasumana, CSU), 2016, (Ph.D.) Colorado State University
18. Tarik Moataz (Co-advisee, Advisor: Indrajit Ray, CSU), 2016, (Ph.D.) Colorado State University and Telecom Bretagne, France
19. Hajar Homayouni (Co-advisee, Advisor: Sudipto Ghosh, CSU), 2017, (M.S.) Colorado State University
20. Kirill Belyaev, 2017, (Ph.D.) Colorado State University
21. Mustafa Al Lail, 2018, (Ph.D.) Colorado State University
22. Ibrahim Lazrig, 2018, (Co-advisor: Indrajit Ray, CSU) (Ph.D.) Colorado State University
23. Hossein Shirazi, 2018, (M.S.) Colorado State University
24. Rejjina Basnet, 2019, (Co-advisor: Ramadan Abdunabi, CSU) (M.S.) Colorado State University
25. Majdi Alnnfai, 2019, (Ph.D.) Colorado State University
26. Andrew Dolan, 2020, (Co-advisor: Suryadipta Majumdar, SUNY Albany) (M.S.) Colorado State University
27. Brandt Reutmann, 2020, (Co-advisor: Joe Gersch, CSU) (M.S.) Colorado State University
28. Kyle Haefner, 2020, (Ph.D.) Colorado State University
29. Jordan Peterson, 2020, (Co-advisor: Vinayak Prabhu, CSU) (M.S.) Colorado State University
30. Hajar Homayouni, 2021, (Advisor: Sudipto Ghosh, CSU) (Ph.D.) Colorado State University
31. Vignesh Pagadala, 2021, (M.S.) Colorado State University
32. Hossein Shirazi, 2021, (Ph.D.) Colorado State University
33. Vishwajeet Bhosale, 2021, (Co-advisor: Lorenzo De Carli, WPI) (M.S.) Colorado State University
34. Upakar Paudel, 2021, (M.S.) Colorado State University
35. Sina Mahdipouri Saravani, 2022, (Co-advisor Ritwik Banerjee, Stony Brook University) (M.S.) Colorado State University
36. Fateme Hashemi Chaleshtori, 2022, (M.S.) Colorado State University
37. Saja Alqurashi, 2023, (M.S.) Colorado State University
38. Shadaab Kawnain Bashir, 2023, (M.S.) Colorado State University
39. Asif Uz Zaman, 2023, (M.S.) Colorado State University
40. Matt Gorbett, 2024, (Ph.D.) Colorado State University

Undergraduate Students

1. Daniel Owens (Summer 2006)
2. Eric Rotaru (Summer 2009)
3. Steven Dibenedetto (Summer 2006 – 2007)
4. Addy Moran (Fall 2016 – Fall 2017)
5. Noah Cain (Summer 2017 – Spring 2018)
6. Jacob Walker (Spring 2017 – present)
7. Jordan Peterson (Summer 2017 – Fall 2018)
8. Jarret Flack (Spring 2018 – Fall 2018)
9. Vi Na Nguyen (Summer 2018 – Fall 2018)
10. Luis Rodriguez (Summer 2018 – Fall 2018)
11. Ariana Mims (Summer 2018 – Spring 2019)
12. Daiana Bilbao (Spring 2019)
13. Landon Zweigle (Summer 2018 – Fall 2021)
14. Sid Sutton (Summer 2020 – Fall 2020)
15. Sophia Ressler (Summer 2020 – Fall 2020))
16. Joseph Riva (Summer 2020 – Fall 2021)
17. Shlok Gondalia (Spring 2020 – Fall 2021)
18. Aeric Walls (Summer 2021 – Fall 2021)
19. Thomas Gunter (Summer 2021 – Fall 2021)
20. Kiley Krosky (Summer 2021 – Spring 2022)
21. Max Bar-On (Summer 2021 – Spring 2023)
22. Nathan Bell (Fall 2021 – Spring 2022)
23. Sam Howard (Fall 2021 – Spring 2022)
24. Braden Hollis (Fall 2022)
25. Matt Maloney (Fall 2022)
26. Britta Maher (Spring 2022 – Fall 2022)
27. Ethan Myers (Spring 2022 – Summer 2022)
28. Tonderai Mudhugu (Fall 2021 – Summer 2022)
29. Videep Venkatesha (Spring 2022 – Fall 2022)
30. Kristine Wiggins (Spring 2022 – Spring 2023)
31. Thomas Harris (Spring 2022 – Spring 2023)
32. Jack Sovereign (Summer 2022 – Spring 2023)
33. Abigail Nelson (Spring 2021 – present)
34. Mason Coco (Summer 2023 – present)
35. Alissa Morgan (Fall 2022 – present)
36. Mussa Hassen (Fall 2023)

Visiting Scholars

- Anna Cinzia Squicciarini, Ph.D. Student, University of Milan (March 2004 – July 2004).
Ivan Paloscia, Undergraduate Student, University of Milan (May 2004 – August 2004).

Outreach

Organized High School Cybersecurity Camp for High School Girls, Summer 2022.

Organized High School Cybersecurity Camp, Summer 2023.

Founding Member, ACM-W, Colorado State University.

Founding Member, WiCyS, Colorado State University.

Established the National Center of Academic Excellence in Cybersecurity Cyber Defense, Colorado State University.

Steering Committee Member, Pathways to Enable Open-Source Ecosystems (POSE), 2023.