

## VITA

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### BHARAT BHARGAVA

Departments of Computer Sciences and Electrical & Computer Engineering (Courtesy)  
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### EDUCATION

1966 B.S. Mathematics (Honors), Punjab University  
1969 B.E. Electrical Communication Engineering (With Distinction), Indian Institute of Science, Bangalore  
1974 MS and Ph.D., Electrical and Computer Engineering, Purdue University  
1971-73 Thirty credit hours toward M.S. in Industrial Administration, Purdue University

### PROFESSIONAL EXPERIENCE

1973-76 Research Associate (Regenstrief Institute), Department of Medicine, Indiana University  
1976-78 Assistant Professor, Cleveland State University  
1978-summer Visiting Faculty, Stanford University  
1978-84 Assistant Professor, University of Pittsburgh  
1984-88 Associate Professor, Purdue University  
1988- Professor, Purdue University,  
1991-2019 Summer Visiting Professor (Various years), ETH-Zurich and EPFL-Lausanne

### HONORS AND AWARDS

1. Fulbright Specialist 2019-2022
2. EAI FELLOW, European Alliance for Innovation
3. First and Second Place award among all posters in CERIAS security Symposium, Purdue University, April 2019 ( Voted by industrial partners)
4. Distinguished Alumnae of D.A.V. College in Jalandhar, India,  
<http://davjalandhar.com/index.php/campus-watch/alumni/1030-distinguished-alumni>
5. Computer Science Department Corporate Partner's Research Award ( voted by industrial partners), April, 2017
6. Helen Schleman Gold Medallion award for Advocating and Advancing Women students and Women issues, Mortar Board, Purdue University, 2017  
<https://www.cs.purdue.edu/homes/bb/Awards2017/Board-of-Trustee-letter-SchlemanBhargava.pdf>
7. Focus Faculty Award for Outstanding Contributions to Disability Accessibility and Diversity, Purdue University, 2017  
<https://www.cs.purdue.edu/news/Bhargava-Wins- Focus-Award.html>  
[https://www.cs.purdue.edu/homes/bb/focus\\_award\\_2017.pdf](https://www.cs.purdue.edu/homes/bb/focus_award_2017.pdf)
8. Best Research Poster award, 6<sup>th</sup> International conference on Cloud Computing and Service Science ( CLOSER), Rome, Italy, 2016

9. Diversity award by College of Science and CS, 2016
10. Best paper award, 6th International IEEE workshop on Dependable Network Computing and Mobile Systems held in conjunction with 34<sup>th</sup> Symposium on Reliable Distributed Systems (SRDS), Montreal, 2015
11. Best research poster award ( voted by Corporate partners), Purdue CERIAS security center symposium, March, 2015
12. Hind Rattan award, India NRI welfare society, 2015
13. Bharat Gaurav award, India Friendship Society, 2014
14. Guest of Honor at Convocation of Chitkara University, Chandigarh, February, 2012
15. Best paper award in International Conference on Advances in Computing Communication – (ICACC), 2011, ( Identity Management in Cloud)  
<http://www.cs.purdue.edu/news/5-4-11ICACC.html>
16. Engagement award by College of Science and CS, 2011
17. Graduate mentoring award by College of Science and CS, 2009
18. Co-best paper award in Secure Knowledge Management Conference, Buffalo, 2005
19. Seed for Success award by Provost at Purdue, 2005.
20. Inducted in The Book of Great Teachers at Purdue, 2003.
21. Best idea paper, International Conference on Data Warehouse and Knowledge Management Conference, 2000.
22. Technical Achievement Award from IEEE Computer Society, 1999.
23. Outstanding Instructor Award (Purdue ACM Student Chapter), 1998.
24. Golden Core Member of IEEE Computer Society.
25. Outstanding Instructor Award (Purdue ACM Student Chapter), 1996.
26. Fellow of Institution of Electronics and Telecommunications Engineers (IETE).
27. Meritorious Service Certificate from IEEE Computer Society.
28. Fellow of Institute of Electrical and Electronics Engineers (IEEE).
29. Best Research Paper Award, IEEE Data Engineering Conference, 1988.
30. WHO'S WHO in Frontiers of Science and Technology.
31. SHELL fellowship, 1969 (Highest award to the best graduate student at Indian Institute of Technology, New Delhi).
32. Indian National Merit Scholarship, 1963-1969.
33. Merit List: Ranked 2nd out of 3500 students in Punjab University state wide examination, 1966.
34. Merit List: Ranked 13th out of 17000 students in Delhi Higher Secondary examination, 1963.

## MEMBER OF PROFESSIONAL ORGANIZATIONS

1. Institute of Electrical and Electronics Engineers (IEEE).
2. Fellow of IEEE, Steering Committee of Technical Committee on Distributed Processing for Symposium on Reliable Distributed Systems.
3. Association of Computing Machinery.
4. Upsilon Pi Epsilon.
5. Institution of Electronics and Telecommunications Engineers (IETE).
6. Fellow of Institute of Electronics and Telecommunications Engineering (IETE)
7. Fulbright Specialist by Fulbright Foundation, (2019-2022)
8. Fellow of European Alliance for Innovation ( EAI)

## RESEARCH INTERESTS

Intelligent Autonomous Systems, Data Analytics, Adversarial Machine Learning, Explainable AI, Software Defined Networks, Moving Target Defense, Theory of Novelties in Open World, Blockchain, Trust Management, Privacy in Data Access, Collaborative Attacks and Defense in Networks

## PATENT

Method and System for Providing Cellular Assisted Secure Communication of a Plurality of Ad hoc Devices (With Motorola), US7817986 B2  
[http://www.cs.purdue.edu/news/10-31-11\\_Bhargava.html](http://www.cs.purdue.edu/news/10-31-11_Bhargava.html)

## RECENT Software and Demos

WaxedPrune System developed for demo in NGC Tech Fest 2016 and for deployment with NGC customers. (Joint work with MIT W3C.org)  
[Surveillance Video Querying - \[VIDEO\]](#), HILDA/SIGMOD, 2020.  
Situation Knowledge on Demand System Demo, NGC Tech Fest, 2020

Following Demos are available on link <https://www.cs.purdue.edu/homes/bb>

Moving Target Defense (MTD) Demo Video  
Data Dissemination Demo Video  
Secure Data Dissemination/Provenance Demo video  
Secure/Resilient Systems Demo video  
Find Them Demo Video

Google Scholar Citations (dated Nov 6 2021)

ALL Since 2016

Citations 17151 4116

h-index 66 31

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## PUBLICATIONS

### 1. Edited Proceedings

1. P. Singh, M. Paprzycki, B. Bhargava, J. Chhabra, N. Kaushal, and Yugal Kumar (Eds.), "Communications in Computer and Information Science", ISSN 1865-0929 ISSN 1865-0937 (electronic), ISBN 978-981-13-3803-8 ISBN 978-981-13-3804-5 (eBook), <https://doi.org/10.1007/978-981-13-3804-5>, Library of Congress Control Number: 2018964612
2. N. Adam, B. Bhargava, M. Halem, and Y. Yesha (eds.) "Digital Libraries Research and Technology Advances," edited proceedings, Springer-Verlag. Lecture Notes in Computer Science No. 1082, 1996, 290 pages and Adam, B. Bhargava, and Y. Yesha. "Digital Libraries," edited proceedings, Springer Verlag, Lecture Notes in Computer Science No. 916, December 1994, 321 pages.
3. N. Adam, B. Bhargava, and Y. Yesha. "Knowledge and Information Management," edited proceedings, ACM Press, 1994, 688 pages.
4. N. Adam and B. Bhargava. "Advanced Database Concepts and Research Issues," edited proceedings, Springer Verlag, Lecture Notes in Computer Science No. 759, September 1993, 451 pages.
5. B. Bhargava. "Parallel and Distributed Systems," edited proceedings, IEEE Press, 1993, 170 pages.
6. B. Bhargava, Y. Yesha, and T. Finin. "Knowledge and Information Management," edited proceedings, ACM Press, 1993, 742 pages.

### 2. Books

7. Futuristic Trends in Network and Communication Technologies, Edited by P. Singh, M. Paprzycki, B. Bhargava, J. Chhabra, N. Kaushal, Y. Kumar, Springer, 2018, ISBN 978-981-13-3804-5
8. Handbook of Wireless Sensor Networks: Issues and Challenges, P. Singh, B. Bhargava, M. Paprzycki, N. Kaushal, W. Hong, Springer, 2020, Nature ISBN 978-3-030-40304-1
9. Managing Trust in Cyberspace (Hardback) Edited by S. Thampi, B. Bhargava, and P. Atrey, CRC Press Inc, December 2013, ISBN 13: 9781466568440 ISBN 10: 1466568445
10. A. Helal, B. Bhargava, and A. Heddaya. "Advanced Replication Techniques for Distributed Systems," Kluwer Academic Publisher, 1996, 150 pages.
11. B. Bhargava (ed.). "Concurrency Control and Reliability in Distributed Systems," Van Nostrand and Reinhold, 1987.

12. CODASYL Systems Committee. A Framework for Distributed Database Systems: Distribution Alternatives and Generic Architectures, September 1982. Published by ACM. 134 pages.

### 3. Book Chapters

13. A. Zhang and B. Bhargava, "Flexible Transaction Models", book chapter in: C. Panos (editor), Extended Transactions Models and Advanced Concurrency Control in Encyclopedia of Database Systems, C. Panos Editor, Springer Verlag, 2008
14. L. Lilien and B. Bhargava, "Privacy and Trust in Online Interactions," book chapter in: K. Chen and A. Fadlalla (eds.), "Online Consumer Protection: Theories of Human Relativism," Idea Group, 2007
15. G. Ding, X. Wu, and B. Bhargava. "Cross-Layer Algorithm for Video Transmission over Wireless Network," in Handbook of Algorithms for Mobile and Wireless Networking and Computing, (A. Boukerche, ed.), CRC Press, 2005.
16. I. Chung, B. Bhargava, and S. Madria. "Taxonomy of Data Management via Broadcasting in a Mobile Computing Environment." Book Chapter in Mobile Computing: Implementing Pervasive Information and Communication Technologies, Kluwer Academic Publishers, December 2002.
17. S. Madria, B. Bhargava, M. Mohania, and S. Bhowmick. "Data and Transaction Management in a Mobile Environment." Book Chapter in Mobile Computing: Implementing Pervasive Information and Communication Technologies, Kluwer Academic Publishers, December 2002.
18. B. Bhargava and A. Helal. "Configurable Distributed Database Systems: Living with Failures and Surviving Catastrophes," Tutorial Notes, IEEE Press, October 1993.
19. H. Tirri, J. Srinivasan, and B. Bhargava. "Integrating Distributed Data Sources Using Federated Objects," in Distributed Object Management, (T. Ozsu, U. Dayal, and P. Valduriez, eds.), Morgan Kaufmann Publisher, Inc., June 1993.
20. B. Bhargava and Y. Jiang. "Transition from Relational to Object Model Implementation," in Advanced Database Concepts and Research Issues, (N. Adam and B. Bhargava, eds.), Springer Verlag, Lecture Notes in Computer Science, No. 759, September 1993.
21. B. Bhargava, Y. Zhang, and E. Mafla. "Communication Facilities for Distributed Transaction Processing Systems," in Readings in Distributed Computing Systems, (T. Casavant and M. Singhal, eds.), IEEE Press, November 1992.
22. B. Bhargava and L. Lilien. "Expert Systems for Fault Tolerant Distributed Database Systems," Essays in Computer Vision and other topics, (Julious Tou, ed.), (dedicated to Professor K.S. Fu), pp. 41-182. June 1990. Published by Academic Sinica.
23. B. Bhargava. "Concurrency Control and Reliability in Distributed Database System," in Software Engineering Handbook, Van Nostrand Reinhold Company, 1983, pp. 331-358.
24. B. Bhargava. "Design of Intelligent Query Systems for Large Databases," in Pictorial Information Systems, Springer-Verlag, May 1980, pp. 431-445

#### 4. Research Journals

##### Submitted

22. N. Wang, J. Fu, J. Liu, B. Bhargava, Secure and Distributed IoT Data Storage in Clouds based on Secret Sharing and Collaborative Blockchain, Submitted to IEEE/ACM Transactions on Networking,
23. N. Wang, S. Zhang, R. Wang, Z. Zhang, Q. Han, J. Fu, and B. Bhargava, Block-based Privacy-preserving Healthcare Data Ranked Retrieval in Encrypted Cloud File Systems, Submitted to Submitted to IEEE Journal of Biomedical science and health Informatics
24. T. Bonjour, M. Haliem, A. Alsalem, Shilpa; L. Yu, V. Aggarwal, M. Kejriwal, B. Bhargava, Decision Making in Monopoly using a Hybrid Deep Reinforcement Learning Approach, Submitted to IEEE Transactions on Emerging Topics in Computational Intelligence
25. X. Zhou, R. Jiang and B. Bhargava, A Novel Data Sharing Scheme in Fog and Cloud Computing Environment, Submitted to IEEE Transactions on Service Computing
26. H. Liu, R. Jiang, B. Bhargava, A Revocable Multi-Authority Attribute-Based Encryption Scheme Based on Ideal Lattices in Cloud Storage" submitted to IEEE Transactions on Cloud Computing.
27. J. Xu, R Jiang, B. Bhargava, "A Novel Dynamic Anti-Collusion Ciphertext Policy Attribute-Based Encryption Scheme in 5G D2D Environment" Submitted to IEEE Transactions on Dependable and Secure Computing
28. J. Fu, N. Wang, B. Cui, B. Bhargava, "Secure and Distributed IoT Data Storage in Clouds based on Secret Sharing and Collaborative Blockchain", Submitted to IEEE Transactions on Cloud Computing
29. M. Haliem, T. Bonjour, A. Alsalem, S. Thomas, V. Aggarwal, B. Bhargava, and M. Kejriwal, "Learning Monopoly Gameplay: A Hybrid Model-Free Deep Reinforcement Learning and Imitation Learning Approach", Submitted to IEEE Transactions on Games, (Feb. 2021).

##### Revised Submissions

30. S. E. Palacios Interiano, J. Krogmeier; A. Ault, "Trellis++: A Practical, Auditable, Privacy-Preserving Certification Framework with Oblivious Smart Contracts." Revised version submitted to IEEE Transaction on Secure and Dependable Computing (TSDC) (Under minor revision)
31. M. Haliem, G. Mani, B. Bhargava, I. Manickam K. Kochpatcharin, M. Kim, E. Vugrin, C. Jenkins, C. Wang P. Angin, M. Meng, Predicting Moving Targets: Machine Learning Based Attacks on Moving Target Defenses, Submitted to IEEE Transactions on Dependable and Secure Computing (under major revision)

##### Accepted

32. M. Haliem, V. Aggarwal, and B. Bhargava, "AdaPool: An Adaptive Model-Free Ride-Sharing Approach for Dispatching using Deep Reinforcement Learning", Accepted and published, IEEE Transactions on Intelligent Transportation Systems, (T-ITS), Nov.2021
33. J. Fu, N. Yao, B. Cui, B. Bhargava, "Defending Trace-back Attack in 3D Wireless Internet of Things" Accepted for Publications the IEEE/ACM Transactions on Networking, Jan 2022

34. M. Villars, B. Bhargava, "Hunting for Insider Threats Using LSTM-based Anomaly Detection", Accepted for Publications in IEEE Transactions on Dependable and Secure Computing, Dec 2021
35. K Solaiman, T. Sun, A Nesen, B. Bhargava, M. Stonebreaker, Applying Machine Learning and Data Fusion to the "Missing Person" Problem, Accepted to appear in IEEE Computer, Dec. 2021
36. M. Haliem, G. Mani, V. Aggarwal, and B. Bhargava, "A Distributed Model-Free Ride-Sharing Approach for Joint Matching, Pricing, and Dispatching using Deep Reinforcement Learning", IEEE Transactions on Intelligent Transportation Systems (T-ITS), Accepted for Publications, June, 2021
37. K. Manchella, M. Haliem, V. Aggarwal, and B. Bhargava, "PassGoodPool: Joint Passengers and Goods Fleet Management with Reinforcement Learning aided Pricing, Matching, and Route Planning", The IEEE Transactions on Intelligent Transportation Systems, (T-ITS) (Accepted for Publication), November, 2021
38. M. Jedh, L. Othmane, N. Ahmed, B. Bhargava, Detection of Message Injection Attacks onto the CAN Bus using Similarity of Successive Messages-Sequence Graphs, IEEE Transactions on Information Forensics & Security, Accepted for Publications, July 2021
39. M. Haliem, V. Aggarwal, and B. Bhargava AdaPool: A Diurnal-Adaptive Fleet Management Framework using Model-Free Deep Reinforcement Learning and Change Point Detection, Accepted and published, IEEE Transactions on Intelligent Transportation Systems, (T-ITS), Accepted for Publication, Oct. 2021, Print ISSN: 1524-9050 Online ISSN: 1558-0016 Digital Object Identifier: 10.1109/TITS.2021.3109611
40. R. Jiang, Q. Zhao, B. Bhargava, RL-ABE: A Revocable Lattice Attribute Based Encryption Scheme Based on R-LWE Problem in Cloud Storage, IEEE Transactions on Services Computing, Accepted to appear, Early Access Feb 2020, DOI: 10.1109/TSC.2020.2973256
41. S. Aneja, N. Aneja, B. Bhargava, S. Islam, Device Fingerprinting using Deep Convolutional Neural Networks, International Journal of Communication Networks and Distributed Systems, Accepted for Publication, June 2021

### **Published**

42. J. Fu, N. Wang, L. Yun, B. Bhargava, "A Practical Framework for Secure Document Retrieval in Encrypted Cloud File Systems", IEEE Transactions on Parallel and Distributed Systems, Vol. 33, No. 5, 1246-1261, May, 2022
43. M. Jedh, L. b. Othmane, N. Ahmed and B. Bhargava, "Detection of Message Injection Attacks onto the CAN Bus using Similarities of Successive Messages-Sequence Graphs," in *IEEE Transactions on Information Forensics and Security*, 16: 4133-4146 (2021), doi: 10.1109/TIFS.2021.3098162.
44. H. Chen, Y. Zhang, Y. Cao, B. Bhargava, Security Threats and Defensive Approaches in Machine Learning System Under Big Data Environment, Wireless personal Communication, Springer-US, pp 1-21, 2021, <https://doi.org/10.1007/s11277-021-08284-8>
45. A. Hu, R. Jiang and B. Bhargava, "Identity-Preserving Public Integrity Checking with Dynamic Groups for Cloud Storage," IEEE Transactions on Services Computing, Vol. 14, No. 4, 1097-1110, 1 July-Aug. 2021, doi: 10.1109/TSC.2018.2859999

46. N. Ahmed and B. Bhargava, Bio-inspired Formal Model for Space/Time Virtual Machine Randomization and Diversification, *IEEE Transactions on Cloud Computing*, April, 2020, On page(s): 1-11 Print ISSN: 2168-7161 Online ISSN: 2168-7161 Digital Object Identifier: 10.1109/TCC.2020.2969353
47. N. Ahmed, B. Bhargava, From Byzantine Fault-Tolerance to Fault-Avoidance: An Architectural Transformation to Attack and Failure Resilience. *IEEE Transactions on Cloud Computing*, Volume 8, No. 3, pp 847-860, September, 2020.
48. I You, C Choi, V Sharma, I Woungang, B. Bhargava, Advances in In Security and Privacy Technologies for Forthcoming Smart Systems, Services, Computing, and Networks, Guest Editorial, *Intelligent Automation and Soft Computing*, 25 (1), 117-119, 2019
49. J. Xu, S. Wang, B. Bhargava and F. Yang "A Blockchain-enabled Trustless Crowd-Intelligence Ecosystem on Mobile Edge Computing", *IEEE Transactions on Industrial Informatics* 15(6): 3538-3547 (2019)
50. J. Fu, L. Yun, B. Bhargava, "Source-Location Privacy Protection based on Anonymity Cloud in Wireless Sensor Networks", *IEEE Transactions on Information Forensics and Security*, Vol. 15, 100-114, May, (2020)
51. H. Chen, C. Meng, Z. Shan, Z. Fu, B. Bhargava, "A novel Low-rate Denial of Service attack detection approach in ZigBee wireless sensor network by combining Hilbert-Huang Transformation and Trust Evaluation" *IEEE Access* 7: 32853-32866 (2019)
52. R. Ranchal, B. Bhargava, P. Angin and L. Ben Othmane, "EPICS: A Framework for Enforcing Security Policies in Composite Web Services," in *IEEE Transactions on Services Computing*, 12(3): 415-428 (2019)
53. Servio Palacios, V. Santos E. Barsallo, B. Bhargava, MioStream: a peer-to-peer distributed live media streaming on the edge, *Multimedia: Tools and Applications*, (2019). Springer
54. M. Javed, E. Hamida, A. Al-Fuqaha and B. Bhargava, Adaptive Security for Internet of Vehicle of Smart Cities, *IEEE Intelligent Transportation Systems Magazine*, 10(2): 110-120 (2018)
55. J. Fu, L. Yun, J. Jiang, B. Bhargava, "Secure Data Storage and Searching for Industrial IoT by Integrating Fog Computing and Cloud Computing", *IEEE Transactions on Industrial Informatics* (A special on Fog Computing for Industrial Applications submission). 14(10): 4519-4528 (2018)
56. X. Wu, R. Jiang, B. Bhargava, "On the Security of Data Access Control for Multiauthority Cloud Storage Systems", *IEEE Transactions on Services Computing*, , No. 10, Vol. 2, pp. 258-272, 2017
57. N. Wang, J. Fu, B. Bhargava, J. Zeng, Efficient Retrieval Over Documents Encrypted by Attributes in Cloud Computing. *IEEE Trans. Information Forensics and Security* 13(10): 2653-2667 (2018)
58. N. Wang, J. Fu, J. Zeng, B. Bhargava, Source-location privacy full protection in wireless sensor networks. *Information. Science.* 444: 105-121 (2018)
59. A. Hu, R. Jiang and B. Bhargava, "Identity-Preserving Public Integrity Checking with Dynamic Groups for Cloud Storage," in *IEEE Transactions on Services Computing*, 2018 doi:10.1109/TSC.2018.2859999

60. P Angin, B Bhargava, R Ranchal, A self-protecting agents based model for high-performance mobile-cloud computing, *Computers & Security*, 77: 380-396 (2018)
61. A. Bijarano, A. Jindal, and B. Bhargava, "Measuring user's influence in the Yelp recommender system", *PSU Research Journal Review*, Vol. 1 Issue: 2, pp.91-104, 2017, <https://doi.org/10.1108/PRR-02-2017-0016>
62. R. Jiang, X. Wu, B. Bhargava, SDSS-MAC: Secure data sharing scheme in multi authority cloud storage systems, *Computers & Security* Vol. 62, pp 193–212, 2016
63. B. Bhargava, A. Johnson, G. Munyengabe, and P. Angin, A Systematic Approach for Attack Analysis and Mitigation in V2V Networks, *Journal of Wireless Mobile Networks, Ubiquitous Computing, and Dependable Applications (JoWUA)* Vol. 7, No. 1, pp. 79-96, 2016
64. R. Ranchal, A. Mohindra, J. Manweiler, B. Bhargava, RADical Strategies for Engineering Web-Scale Cloud Solutions. *IEEE Cloud Computing* 2(5): 20-29 (2015)
65. L. Othmane, R. Fernando, R. Ranchal, B. Bhargava, E. Bodden, Incorporating Attacker Capabilities in Risk Estimation and Mitigation, *Journal of Computers and Security*, Volume 51, pp. 41–61, June 2015
66. Y. Zhong, B. Bhargava, Y. Lu, P. Angin, A computational Dynamic Trust Model for User Authorization, *IEEE Transaction on Dependable and Secure Computing*, Vol. 12, No. 1, pp. 1-15, 2015
67. K. Xu, Y. Sun, B. Bhargava: An Introduction to the Enterprise-Participant (EP) Data Model. *International Journal of Next Generation Computing (IJNGC)*, Vol. 5, No. 3, pp. 304-317, 2014
68. L. Othmane, R. Fernando, R. Ranchal, B. Bhargava, E. Bodden, Likelihood of Threats to Connected Vehicles. *International Journal of Next Generation Computing (IJNGC)*, Vol. 5, No. 3, pp. 290-303, 2014
69. R. Jiang, B. Bhargava: Formal Theory for Security Protocol Analysis of Distributed Denial of Service. *International Journal of Next Generation Computing (IJNGC)*, Vol. 5, No. 3, pp. 233-248, 2014
70. A. Can, B. Bhargava: k-anonymity Chord for Anonymous Query Response. *International Journal of Next Generation Computing (IJNGC)*, Vol. 5, No. 3, pp. 274-289, 2014
71. L. Othmane, P. Angin, H., Weffers, B. Bhargava, Extending the Agile Development Approach to Develop Acceptable Secure Software, *IEEE Transaction on Dependable and Secure Computing* Vol.11, No. 6, pp. 497-509, 2014
72. B. Panja, D. Morrison, P. Meharia, B. Bhargava, A. Prakash, Group Security of V2V using Cloud Computing Processing and 4G Wireless Services, *International Journal of Next Generation Computing (IJNGC)*, Vol. 5, No. 3, pp. 218-232, 2014
73. B. Bhargava, I Khalil, R. Sandhu, "Securing Big Data Applications in the Cloud", Guest Editors' Introduction, *IEEE Cloud Computing* 1(3): 24-26, 2014
74. H. Chen, B. Bhargava, Z. Fu, Multilabels-Based Scalable Access Control for Big Data Applications. *IEEE Cloud Computing* 1(3): 65-71, 2014
75. L. Lilien, L.B. Othmane, P. Angin, A. DeCarlo, R. Salih, B. Bhargava. , A Simulation Study of Ad Hoc Networking of UAVs with Opportunistic Resource Utilization Networks.

- Journal of Network and Computer Applications, Special Issue on Advanced Technologies for Homeland Defense and Security, Vol. 38, pp. 3-15, 2014.
76. B. Panja, B. Bhargava, S. Pati, D. Paul, L. Lilien, P. Meharia, Monitoring and Managing Cloud Computing Security using Denial of Service Bandwidth Allowance, *Recent Patents on Computer Science*, Vol. 6, No. 1, pp. 73-81, 2013.
  77. H. Kim, R. Oliveira, B. Bhargava, J. Song, A Novel Robust Routing Scheme against Rushing Attacks in Wireless Ad Hoc Networks, *Wireless Personal Communications*, Volume 70, Issue 4, pp 1339-1351, ISSN: 0929-6212, 2013.
  78. L.B. Othmane, H. Weffers, P. Angin, B. Bhargava, A Time-Evolution Model for the Privacy Degree of Information Disseminated in Online Social Networks, *International Journal of Communication Networks and Distributed Systems*, Vol. 11, No. 4, pp. 412-430, 2013.
  79. T. Gong, B. Bhargava, "Immunizing mobile ad hoc networks against collaborative attacks using cooperative immune model", *Security and Communication Networks* Vol. 6: pp. 58-68, 2013.
  80. P. Angin, B. Bhargava, "A Confidence Ranked Co-occurrence Approach for Accurate Object Recognition in Highly Complex Scenes" *Journal of Internet Technology*, Vol. 14, No. 1, pp. 13-19, 2013.
  81. P. Angin and B. Bhargava, "An Agent-based Optimization Framework for Mobile-Cloud Computing" *Journal of Wireless Mobile Networks, Ubiquitous Computing, and Dependable Applications (JoWUA)* Vol. 4, No. 2, pp. 1-17, 2013.
  82. L. Yao, T. Gong, J. Fan, B. Bhargava, Research on ARM9-Based Intelligent Immune System for Avoiding Rear-End Collision, *International Journal of Immune Computation (IC)* Vol. 1, No. 1, pp. 4-8, 2013
  83. A. Can, B. Bhargava: SORT: A Self-ORganizing Trust Model for Peer-to-Peer Systems. *IEEE Trans. Dependable and Secure Computing*. 10(1): 14-27, 2013
  84. T. Shon, A. Vasilakos, B. Bhargava, I. Stojmenovic, H. Jin, A. Zomaya: Editorial for Special Issue on "New Technologies and Applications for Wireless Communications & Mobile Cloud Computing". *MONET* 18(1): 98-102, 2013
  85. K. Kumar, J. Liu, Y Lu, B. Bhargava, A Survey of Computation Offloading for Mobile Systems, *ACM Springer Mobile Networks and Applications (MONET) Journal*, special issue on ACM Mobile computing, Vol. 18, No. 1, 129-140, Feb. 2013
  86. B. Bhargava, P. Angin, R. Ranchal, R. Sivakumar, A. Sinclair, M. Linderman A Trust based approach for Secure Data Dissemination in Mobile Peer to Peer Network of AVs, *International Journal of Next Generation Computing*, Vol 3, No. 1, 2012
  87. N. Idika, B. Bhargava. Extending Attack Graph-Based Security Metrics and Aggregating Their Application. *IEEE Transaction on Dependable and Secure Computing* 9(1): 75-85 2012
  88. R. Jiang, M. Azarmi, T. Gong, B. Bhargava. Novel Secure and Dynamic Clustering Protocols in Wireless Sensor Networks. *Elsevier Computers & Security*, 2011
  89. P. Angin, B. Bhargava. Real-time Mobile-Cloud Computing for Context-Aware Blind Navigation. *International Journal of Next Generation Computing*, Vol 2, No 2, 2011

90. Y. Zhang and B. Bhargava. Allocation schemes, Architectures, and Policies for Collaborative Port Scanning Attack. *Journal of Emerging Technologies in Web Intelligence*, Vol 3, No 2, 154-167, May 2011 doi:10.4304/jetwi.3.2.154-167, 2011
91. A. Shirsat and B. Bhargava. Local geometric algorithm for whole boundary. *Security and Communication Networks*, Wiley Online Library. DOI: 10.1002/sec.271; 3:1–10, 2010
92. Y. Lu and B. Bhargava. "SAGA: Self-Adjusting Congestion Avoidance Routing Protocol for Ad Hoc Networks", In *International Journal of Next-Generation Computing (IJNGC)*, Vol. 1, No 1, 124-144, 2010
93. L. Lilien, A. Bhargava, and B. Bhargava, "A Road from Fraud Vulnerabilities and Threats to Fraud Avoidance and Tolerance", *IPSI internal Journal on Emerging Technologies*, 2009
94. B. Bhargava, Y. Zhang, N. Idika, L. Lilien, M. Azarmi, "Collaborative Attacks in WiMAX Networks", *Wiley Journal on Security and Communication Networks*, 2(5): 373-391, 2009
95. Y. Zhang and B. Bhargava, Self-Learning Disk Scheduling, *IEEE Transactions on Knowledge and Data Engineering*, Vol. 21, No. 1, 50-65, 2009
96. S. Mohanty and B. Bhargava, Invisible Watermarking Based on Creation and Robust Insertion-Extraction of Image Adaptive Watermarks, *ACM Transaction on Multimedia Computing, Communication and Applications (ACM TOMCCAP)*, Vol. 5, No. 2, 1-24, 2008
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##### **5. Refereed Conference Proceedings**

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178. M. Villarreal-Vasquez, B. Bhargava, J. Macdonald, ConFoc: Content-Focus Protection Against Trojan Attacks on Neural Nets, Submitted (In review)
179. T. Bonjour, V. Aggarwal and B. Bhargava, "Information-Theoretic Approach to Detect Collusion in Multi-Agent Games", Submitted to International Conference on Autonomous Agents and Multi-Agent Systems) AAMAS, 2022 (In review)
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364. A. Zhang, M. Nordine, B. Bhargava, and O. Bukhres. "Ensuring Semi-Atomicity for Flexible Transactions in Multi-database System," in Proceedings of the ACM SIGMOD Conference, May 1994, Minneapolis, pp. 67-78.
365. A. Zhang and B. Bhargava. "Enforceable Inter-database Constraints in Integrating Multiple Autonomous Databases," in IEEE Proceedings of the Fourth International Conference on Data and Knowledge Systems for Manufacturing and Engineering, May 1994, Hong Kong, pp. 645-650.
366. B. Bhargava and A. Helal. "Availability Mechanisms in Raid Distributed Database System," in International Conference on Information and Knowledge Management (CIKM), November 1993, Washington DC.
367. Y. Zhang and B. Bhargava. "WANCE: Wide Area Network Communication Emulation Systems," in Proceedings of the IEEE Workshop on Parallel and Distributed Systems, Princeton, N.J., October 1993.
368. B. Bhargava, Y. Jiang. "O-Raid: Experiments and Experiences," in Proceedings of International Conference on Intelligent and Cooperative Information Systems, Rotterdam, Netherlands, May 1993, (invited paper).
369. J. Srinivasan, Y. Jiang, and B. Bhargava. "Experiments in O-Raid Distributed Object-Oriented Database System," in Proceedings of the International Conference on Information and Knowledge Management, Baltimore, November 1992.
370. B. Bhargava. "From Relational to Object Based Distributed Database System," in Baltimore, November 1992, (invited paper).
371. H. Tirri, J. Srinivasan, and B. Bhargava. "Federated Objects: A Pragmatic Approach to Data Integration," in Proceedings of International Workshop on Distributed Object Management, Edmonton, Canada, August 1992.
372. B. Bhargava, S. Browne, and J. Srinivasan. "Composite Object Replication in Distributed Database Systems," in Proceedings of the International Conference on Information System and Management of Data, Bangalore, Published by INSDOC, July 1992, pp. 115-134.
373. T. Nixon, K. Lubenow, J. Srinivasan, P. Dewan, and B. Bhargava. "Building a User-Interface for the O-Raid Database System using the Suite Systems," in Proceedings of the International Conference on System Integration, Newark, June 1992.
374. Helal, Y. Zhang, and B. Bhargava. "Surveillance for Controlled Performance Degradation during Failures," in Proceedings of the 25th Hawaii International Conference on Systems Sciences, Hawaii, January 1992.
375. B. Bhargava. "Experiments in Raid Distributed Systems," in Proceedings of the International Seminar on Directions of Future Database Research (Abstract), Dagshule, September 1991.
376. Auddino, E. Amiel, and B. Bhargava. "Experiences with SUPER, a Database Visual Environment," in Proceedings of the International Conference on Databases and Expert System Applications (DEXA), Berlin, August 1991.
377. E. Mafla and B. Bhargava. "Implementation and Performance of a Communication Facility for Distributed Transaction Processing," in Proceedings of the Second Usenix Symposium on Experiences with Distributed and Multiprocessor Systems, Atlanta, March 1991.

378. B. Bhargava and S. Lian. ``Typed Token Approach for Database Processing During Network Partitioning,” in Proceedings of International Conference on Management of Data (COMAD), New Delhi, India, December 1990.
379. B. Bhargava and A. Helal. ``Replication Experiments in Raid Distributed Database Systems, Indian Computer Congress,” Hyderabad, India, November 1990. (keynote talk)
380. B. Bhargava and S. Browne. ``Communication-based Recovery in Replicated Databases,” in Tenth International Conference on Computer Communications, New Delhi, India, November 1990.
381. J. Mullen, J. Srinivasan, P. Dewan, and B. Bhargava. ``Supporting Queries in the O-Raid Object-Oriented Database System,” in Fourteenth IEEE Computer Software and Applications Conference, Chicago, Ill, October 1990.
382. B. Bhargava, K. Friesen, A. Helal, and J. Riedl. ``Adaptability Experiments in the Raid Distributed Database Systems,” in Proceedings of Ninth IEEE Symposium on Reliability in Distributed Systems, Huntsville, AL, October 1990.
383. B. Bhargava, E. Mafla and J. Riedl. ``Communication in the Raid Distributed Database System,” in Proceedings of Ninth IEEE International Phoenix Conference on Computers and Communications, Scottsdale, AZ, March 1990.
384. B. Bhargava, S. Browne. ``Adaptable recovery Using Dynamic Quorum Assignments,” in Proceedings of the Sixteenth International Conference on Very Large Data Bases (VLDB), Brisbane, Australia, August 1990.
385. B. Bhargava, P. Dewan, J. Mullen and A. Vikram. ``Implementing Object Support in the RAID Distributed Database System,” in Proceedings of First IEEE International Conference on System Integration, Morris Town, NJ, April 1990.
386. B. Bhargava, P. Leu, S. Lian. ``Experimental Evaluation of Concurrent Check-pointing and Rollback-Recovery Algorithms,” Proceedings of 6th IEEE Data Engineering Conference, Los Angeles, February 1990.
387. C. Koelbel, F. Lamaa, B. Bhargava. ``Efficient Implementation of Modularity,” in Proceedings of USENIX-IEEE Workshop on Experiences with Building Distributed (Multiprocessor) System, October 1989, Florida.
388. P. Dewan, B. Bhargava, A. Vikram. ``Engineering the Object-Relation Database Model in O-Raid,” in Proceedings of the International Conference on Foundations of Data Organization and Theory, June 1989, Paris (Springer Verlag, Vol. 367).
389. Bhargava and P. Leu. ``A Model for Concurrent Check-pointing and Recovery Using Transactions,” in Proceedings of the Ninth IEEE International Conference on Distributed Computing Systems, June 1989, Newport Beach, Ca.
390. Helal, J. Srinivasan, and B. Bhargava. ``SETH: A Quorum-Based Replicated Database for Experimentation with Failures,” in Proceedings of the Fifth IEEE Data Engineering Conference, February 1989, Los Angeles.
391. B. Bhargava, E. Mafla, J. Riedl and B. Sauder. ``Implementation and Measurements of Efficient Communication Facilities for Distributed Database Systems,” in Proceedings of the Fifth IEEE Data Engineering Conference, February 1989, Los Angeles.
392. B. Bhargava and S. Browne. ``A Generic Algorithm for Transaction Processing During Network Partitioning,” in Proceedings of the Eighth International Conference on

Foundations of Software Technology and Theoretical Computer Science, December 1988, Pune, India (Springer Verlag, Vol. 338).

393. B. Bhargava and S. Browne. "Using Replication to Implement Reliable Storage," in Proceedings of the Twenty-sixth Annual Allerton Conference on Communication, Control, and Computing, September 1988, Monticello, IL.
394. B. Bhargava and S. Lian. "Independent Check-pointing and Concurrent Rollback for Recovery in Distributed Systems-An Optimistic Approach," in Proceedings of the Seventh IEEE Symposium on Reliability in Distributed Systems, October 1988, Columbus.
395. B. Bhargava and J. Riedl. "Implementation of RAID," in Proceedings of the Seventh IEEE Symposium on Reliability in Distributed Systems, October 1988, Columbus.
396. B. Bhargava, D. Sabo, and P. Noll. "An Experimental Analysis of Replicated Copy Control during Site Failure and Recovery," in Proceedings of the Fourth IEEE Data Engineering Conference, February 1988, Los Angeles.
397. B. Bhargava, T. Mueller, and J. Riedl. "Experimental Analysis of Layered Ethernet Software," in Proceedings of the ACM-IEEE Fall Joint Computer Conference, October 1987, Dallas.
398. B. Bhargava and J. Riedl. "Design on an Adaptable Distributed System," in Proceedings of the Tenth IEEE International Conference on Computer Software and Applications, Chicago, 1986, pp.114-122.
399. B. Bhargava and J. Riedl. "Implementation of Distributed Transactions in RAID," IEEE Computer Society's Workshop on Design Principles for Experimental Distributed Systems, Purdue University, 1986 (abstract only). (Extended version was invited for presentation at ACM SIGOP Workshop, Making Distributed Systems Work, Amsterdam, September 1986.)
400. P. Leu and B. Bhargava. "Multidimensional Timestamp Protocols for Concurrency Control," in Proceedings of the Second IEEE Data Engineering Conference, Los Angeles, 1986, pp. 482-489.
401. B. Bhargava and Z. Ruan. "Site Recovery in Distributed Database Systems with Replicated Data," in Proceedings of the Sixth IEEE International Conference on Distributed Computing Systems, Cambridge, 1986, pp. 621-627.
402. C. Hua, B. Bhargava: Analysis of the Majority Consensus Concurrency Control Algorithm for Correctness and Performance Using the Event Ordering Approach. INFOCOM 1983: 340-351
403. B. Bhargava and L. Lilien. "Cost Analysis of Selected Database Restoration Techniques," in Proceedings of the International Conference on Entity-Relationship Approach, Anaheim, 1983, pp. 783-805.
404. C. Hua and B. Bhargava. "Analysis of the Majority Consensus Concurrency Control Algorithm for Correctness and Performance Using the Event Ordering Approach," in Proceedings of the IEEE Conference on Information and Communication, San Diego, 1983.
405. B. Bhargava. "Evaluation of Network Merging based on Optimistic Concurrency Control and Rollback Semantics," in Proceedings of the Sixth IEEE International Conference on Computer Software and Applications, Chicago, 1982.

406. C. Hua and B. Bhargava. "Classes of Serializable Histories and Synchronization Algorithms in Distributed Database Systems," in Proceedings of the IEEE International Conference on Distributed Computing Systems, Miami, 1982, pp. 438- 446.
407. B. Bhargava. "Performance Evaluation of the Optimistic Concurrency Control Approach to Distributed Database Systems and its Comparison with Locking," IEEE International Conference on Distributed Computing Systems, Miami, 1982, pp. 508- 517.
408. B. Bhargava. "Resiliency features of the optimistic concurrency control approach for distributed database systems" Proceedings of 2nd IEEE Symposium on Reliability in Distributed Software and Database Systems, 1982
409. B. Bhargava. "Software Reliability in Real-Time Systems," in Proceedings of the National Computer Conference, 1981, pp. 297-309.
410. B. Bhargava and L. Lilien. "Feature Analysis of Selected Database Recovery Techniques," in Proceedings of the National Computer Conference, pp. 543-553, 1981.
411. B. Bhargava. "An Optimistic Concurrency Control Algorithm and its Performance Evaluation Against Locking," in Proceedings of the International Computer Symposium, Taiwan, 1980.
412. C. McDonald, B. Bhargava, and D. Jeris. "A Clinical Information System for Ambulatory Care," in Proceedings of the National Computer Conference, 1975, pp. 749-756.
413. B. Bhargava and C. McDonald. "Tree Systems for Medical Information Processing," Proceedings of Eleventh Annual Rocky Mountain Bio-engineering Symposium, 1974.
414. B. Bhargava and K. Fu. "Transformation and Inference of Tree Grammars for Syntactic Pattern Recognition," in Proceedings of the IEEE International Conference on System, Man, and Cybernetics, 1974, pp. 330-334.
415. B. Bhargava and K. Fu. "Stochastic Tree Systems for Syntactic Pattern Recognition," in Proceedings of the Twelfth Annual Allerton Conference on Circuit and System Theory, 1974, pp. 278-287.

### **Research Grants/Contracts**

1. Stabilizing Hostilities through Arbitration and Diplomatic Engagement (SHADE)" DEXTER, Submitted to Darpa (Joint with ISI/USC), \$300,000 (2022-2023)
2. VecDB: A Cloud-Native Vector Data Management System, Submitted to NSF as co-PI, (PI: Jianguo Wang), \$599,000 (2023-2026)

3. Theme 1: NSF AI Institute for Active Cyber Defense Leveraging Intelligent Agents, Preliminary Proposal Submitted to NSF as Co-PI (PI: Prasad Calyam at UM-Columbia) (Encouraged and Invited for full proposal)
4. Software Defined Networking in Automotive Environment, Ford Corporation, \$213,054 (2020-2022)
5. Real Applications of Learning Machines (REALM) Consortium, Northrop-Grumman Corporation, 2019-2022 (\$460K per year with MIT, CMU, Stanford), (\$200,000 per year Purdue share for last three years) (Ranked highest in nationwide competition), 2019-2099 (unrestricted research fund)
6. Microsoft Corporation \$19.5K (gift by alumni)
7. Countering Adversarial AI/ML for Protection and Threat Recognition in Intelligent Autonomous Systems, Northrop Grumman Corporation, \$125,000, 2020-2021
8. Generating Novelty in Open-world Multi-agent Environments (GNOME), Darpa (joint with USC-ISI), \$1,245,990 (Purdue share over 42 months) (Total approximately \$3.5 million) 2019-2023
9. MTD algorithm and adaptation on an ARINC-825/CAN bus and SpaceWire (SpW) bus, Sandia Laboratory, \$130,000 per year, (\$205,000 received) 2019-2021
10. Secure Intelligent Autonomous Systems with Cyber Attribution, Northrop-Grumman Corporation, \$125,000, 2018- 2019
11. Secure graph databases, JPL/NASA, \$24,500, 2018
12. Secure Intelligent Autonomous Systems with Cyber Attribution, Northrup Grumman Corporation, \$125,000, 2018-2019
13. Intelligent Autonomous Systems, Northrop-Grumman Corporation, \$150,000, 2017-2018
14. Privacy Preserving Data Dissemination and Data leakage, Purdue Computer Science Corporate Partner Award, Support of one graduate student and travel 2017-2018, \$50,000
15. Engineering Security and Performance Aware Vehicular Applications for Safe and Smarter Roads, funded by Qatar Foundation (with Ala Al-Fuqaha and Elyes Ben Hamida), \$1,000,000, 2015-2018 (Purdue share \$135,000)
16. Secure/Resilient Systems and Data Dissemination/Provenance, Northrop-Grumman Corporation, \$200,000, 2016-2017
17. Privacy-Preserving Data Dissemination and Adaptable Service Compositions in Trusted & Untrusted Cloud, Northrop-Grumman Corporation, \$210,000 (additional \$40,000 for MIT collaboration), 2015-2016
18. Monitoring-Based System for E2E Security Auditing and Enforcement in Trusted and Untrusted SOA, Northrop-Grumman Corporation, \$199,992, 2014-2015
19. End to End Security in Mobile Cloud, AFRL, \$11,000, 2013
20. End to End Security Policy Auditing and Enforcement in Service Oriented Architecture, Northrop-Grumman Corporation, \$200,000, 2013-2014
21. Planning Grant: I/UCRC for Net-Centric Software and Systems Center Research Center, NSF, \$24,123, 2013-2015

22. Protecting and Securing Supply Chain Data throughout its Life-cycle and CERIAS security center, \$15,000, 2012-2013
23. Protecting and Securing Supply Chain Data throughout its Life-cycle, PLM center of Excellence, \$30,000, 2012-2013
24. Opportunistic Resource Utilization Networks for UAV Ad-Hoc Networking, Navy STTR (with Andrew DeCarlo and Leszek Lilien), Amount: \$70,000, 2010-2011
25. Security in Service-Oriented Architecture, Air Force, Amount: \$295,000, 2010-2011
26. Context based Adaptable Defense against Collaborative Attacks in Service Oriented Architecture, Northrop-Grumman Corporation, Amount: \$105,000, 2009-2010
27. ``ITR: Scalable Edge Router for Differentiated Services Networks,`` NSF, Amount: \$364,828, (2002-2008).
28. ``Vulnerability Analysis and Threat Assessment,`` NSF REU grant, Amount \$5,000, (2008-2009)
29. ``Workshop on Pervasive Systems``, Funding obtained from CRA-W, Air Force, and proposal submitted to NSF (with Sanjay Madria), 2008
30. Event-order based model for Collaborative Attack, PRF, 2008-2010
31. ``Collaborative Attacks on Wireless Networks``, Institute for Information Infrastructure Protection (I3P) Through Homeland Security and Dartmouth College, Amount \$150,000 (2007-2009)
32. ``Supplement to Secure Mobile Systems``, NSF, Amount: \$52,000 (2006-2007).
33. ``The Regenstrief Institute for Healthcare Engineering: Applying the Principles of Engineering and Management for the Improvement of Healthcare,`` Regenstrief Foundation, Amount: \$1,000,000 per year (with Joe Pekny and Charles Rutledge and others), (2004-2014).
34. ``Secure Private Communication in Mobile Ad Hoc Networks,`` Institute for Information Infrastructure Protection (I3P) Through Homeland Security and Dartmouth College, Amount: \$149,081, (2004-2006).
35. ``Supplement: ITR: Scalable Edge Router for Differentiated Services Networks,`` NSF, Amount: \$45,000, (2006-2008).
36. ``REU Supplement: ITR: Scalable Edge Router for Differentiated Services Networks,`` NSF, Amount: \$15,000 (2006-2008).
37. ``Cellular Assisted Mobile Ad hoc (CAMA) Networks,`` funded by Motorola, Amount: \$30,000, (2003).
38. ``Vulnerability Analysis and Threat Assessment/Avoidance,`` NSF, Amount: \$212,473, (2003-2009).
39. ``Trusted Routing and Intruder Identification in Mobile Ad Hoc Networks,`` CERIAS and Lilly Foundation, Amount: \$22,000, (2002-2003).
40. ``Trusted Route Recovery in Ad Hoc networks,`` CISCO, Amount: \$85,000, (2002-).
41. ``ITR: Scalable Edge Router for Differentiated Services Networks,`` NSF, Amount: \$364,828, (2002-2008).

42. ``Formalizing Evidence and Trust for User Authorization,’’ NSF, Amount: \$335,593, (2002-2007).
43. ``Experiments in Security and QoS in Mobile Systems,’’ NSF, Amount: \$109,000, (2001-2003).
44. ``Behavior Based Artificial Agents for Information Security,’’ CERIAS and Lilly Foundation, Amount: \$62,500, (with A. Chaturvedi and S. Mehta), (2001-2002).
45. ``Secure, Survivable, Jam Resistant Communications and Network Management,’’ CERIAS and Lilly Foundation, Amount: \$75,000, (with M. Zoltowski’s), (2001-2002).
46. ``Consortium for E-commerce Center,’’ Indiana 21st Century Research and Technology Fund, Amount: \$1,000,000. (PI: Professor S. Mehta in Krannert), (2001-2003).
47. ``Time Based Coordination of Network Embedded Nodes,’’ DARPA, Amount: \$1,900,000. (PI: Professor Kim at UC Irvine), (2001-2004).
48. ``Secure Mobile Systems,’’ NSF, Amount: \$279,172 (2000-2006).
49. ``Static and Dynamic Security in Web Data warehouses,’’ CERIAS and Lilly Foundation, (with Madria and Mohania) Amount: \$70,000 (2000-2002).
50. ``MSI: A Research Infrastructure for Integrated Quality of Service in Multimedia Computing Environments,’’ NSF, (with seven Co-PIs), Infrastructure Grant, Amount: \$2,600,000 (1999-2004).
51. ``Distributed System Architecture and Services for Multimedia Systems,’’ IBM, Amount: \$35,000 (1999-2003).
52. ``Experiments in Adaptable Distributed Systems,’’ NSF, (1999-2003), Amount: \$251,500.
53. ``Experiments in Adaptable Communication Systems,’’ NS, (1999-2001), Amount: \$66,000.
54. ``Security Issues in Mobile Networks with Movable Base Stations,’’ CERIAS and Lilly Foundation, Amount: \$80,000, (1999-2001).
55. ``Multimedia Traffic Control using Active Networks,’’ PRF, Amount: \$23,332, (1999-2001).
56. ``Adaptable Video Conferencing,’’ (collaboration with EPFL, Lausanne), Purdue Office of International Programs, Amount: \$2,500.
57. ``Experiments in Adaptable Communication Services,’’ NSF, (1999-2001), Amount \$66,000.
58. ``Integrated Analysis & Testing of Distributed Software,’’ IBM, (1997-1998), Amount: \$49,998.
59. ``REU Supplement to Communication Experiments for Widely Distributed Environments,’’ NSF, (1996-1998), Amount: \$10,000.
60. ``Adaptable Video Conferencing,’’ AT&T Foundation, (October 1995-September 1996), Amount: \$23,000.
61. ``Distributed System Control,’’ Air Force Rome Laboratory (via Lockheed Martin), (1995-1996), Amount: \$75,000.

62. `` REU Supplement to Communication Experiments for Widely Distributed Environments,” NSF, (1997-1998), Amount: \$10,000.
63. ``Consistency and Transaction Management in Mobile Computing Environment,” Purdue Research Fellowship grants, (February 1994), Amount: \$20,400.
64. ``Communication Experiments for Widely Distributed Environments,” National Science Foundation, Amount: \$314,641, (July 1995-December 1999).
65. ``Characterization of Architecture Framework and Replication,” Defense Information System Agency (DISA), Amount \$75,000, (August 1994-January 1995). (Through Army Research Laboratory Contract).
66. ``Information Retrieval for a Large Repository of Complex Data,” NASA, (July 1994-June 1997), Amount: \$66,000.
67. ``Six International Travel grants,” Purdue Research Foundation and MUCIA.
68. ``Experiments in Large Scale Distributed Systems,” AT&T Foundation, (November 1993-October 1994), Amount: \$25,000 (with Michael Young).
69. ``Experiments in Transition to Large Scale Open System Environment,” Army Research Laboratory (Software Technology Branch), (January 1993-1995), Amount: \$812,000 (joint funding with DISA).
70. ``Experiments in Adaptability to Failures in Distributed Systems,” NASA, (July 1991-June 1994), Student Fellowship, Amount: \$22,000 per year.
71. ``Communications Software for Reliable Distributed Systems,” AT&T Foundation, (November 1990), Amount: \$30,000.
72. ``Distributed Object Database System,” NASA, (July 1990-June 1993), Student Fellowship, Amount: \$22,000 per year.
73. ``Reliable Processing in Distributed Database Systems,” National Science Foundation (REU supplement), (May 1990-July 1991), Amount: \$8,000.
74. ``Adaptability to Failures in Distributed Systems,” Purdue Research Foundation, (August 1990 -August 1992), Amount: \$24,000.
75. ``Design and Implementation of an Adaptable Distributed System,” U.S. Army Institute for Research in Management Information, Communication, and Computer Sciences (AIRMICS), (January 1992-December 1992), Amount: \$101,832.
76. ``Design and Implementation of an Adaptable Distributed System,” U.S. Army Institute for Research in Management Information, Communication, and Computer Sciences (AIRMICS), (April 1990-December 1991), Amount: \$98,554.
77. ``Reliable Processing in Distributed Database,” National Science Foundation, (August 1989-July 1991), Amount: \$57,027.
78. ``Check-pointing in Distributed Systems,” Purdue Research Foundation, (August 1988-August 1990), Amount: \$14,400.
79. ``Replication Copy Control,” Unisys, (August 1988-August 1989), Amount: \$30,000.
80. ``Experiments in Communications and Distributed Systems,” AT&T, (November 1988-December 1989), Amount: \$30,000.
81. ``Design of an Adaptable Distributed System: Phase IV,” AIRMICS (grant via NASA), (May 1989-April 1990), Amount: \$120,281.

82. ``Design of an Adaptable Distributed System: Phases III,`` AIRMICS (grant via NASA), (March 1988-April 1989), Amount: \$115,600.
83. ``Design of an Adaptable Distributed System: Phase II,`` AIRMICS (grant via NASA), (May 1987-February 1988), Amount: \$122,391.
84. ``Design of an Adaptable Distributed System,`` AIRMICS (grant via NASA), (June 1986-May 1987), Amount: \$83,473.
85. ``Design of an Adaptable Distributed System,`` NASA, (June 1986-May 1987), Amount: \$31,075.
86. ``Site Failure/Network Partition Recovery,`` SPERRY Corporation, (June 1, 1986-March 1988) (with Mike Atallah), Amount: \$60,000.
87. ``Design of an Adaptable Distributed System,`` Purdue Research Foundation (August 1986-July 1988), Amount: \$14,100.
88. ``Reliability and Integrity in Distributed Database Systems,`` SPERRY Corporation, (June 1, 1985-May 31, 1986) (with Mike Atallah), Amount: \$60,000.
89. ``An Integrated Approach to Software Reliability,`` U.S. Dept. of Transportation, (1985-1988): up to \$200,000, based on task-order contracts.
90. ``Systems Structures for Software Reliability in Enroute Air Traffic Control Systems,`` (Phases 2 and 3) U.S. Dept. of Transportation, (March 1983-February 1985), Amount: \$64,000.
91. ``Systems Structures for Software Reliability in Enroute Air Traffic Control Systems,`` U.S. Dept. of Transportation, (September 1980-March 1983), Amount: \$56,000.
92. ``Software Reliability in Air Traffic Control Systems,`` U.S. Dept. of Transportation, (September 1979-August 1980), Amount: \$47,000.

## **Editorial Boards**

1. Editor-in-Chief: International Journal of Security and Its Applications (ISSN: 1738-9976)
2. Editor-in-Chief of International Journal of Multimedia Technology (IJMT)
3. Editor-in-Chief of Journal of Advanced Computer Science & Technology (ISSN: 2227-4332)
4. Editor of IEEE Transactions on Cloud Computing, (2016- 2020)
5. Editor of IEEE Transactions on Knowledge and Data Engineering, (1996-2000)
6. World Wide Web Journal (Guest Editor), Special Issue on Information Management on Internet, (2002).
7. Editor of Journal of System Integration, (1999-2012).
8. Editor of International Journal of Advance Innovations, Thoughts & Ideas (ISSN: 2277-1891)
9. Editor of International Journal of Multi-Media Systems' Tools and Applications, (1998-2020).
10. Editor of International Journal of Cooperative Information Systems, (1999-2012).
11. Editor of IEEE Transactions on Mobile Computing, (2004-2008).

12. Member of Advisory Board International Journal on Systems, Cybernetics, and Informatics (Indian publication), (2012-)
13. Editor of International Journal of Communication Networks and Distributed Systems, (IJCND) ( 2011-)
14. Editor of Recent Patents On Computer Science, Bentham Science Publishers ( 2011-)
15. Member of Advisory Board for the Journal of Science, Technology and Management, India
16. Associate editor of International Journal on Digital Library Systems, ( 2010- 2014)
17. Editor of Journal of Advances in Multimedia, ( 2011-)
18. Advisory Board of FTRA - Future Technology Research Association International
19. Editor of *Journal of Information Security (JIS)*, ( 2010-)
20. Editor of International Journal of Information and Telecommunication Technology, ( 2010-)
21. International Journal of Next-Generation Computing (IJNGC), ( 2010-)
22. Journal of Immune Computation, ISSN : 2234-4306 (Print), ISSN : 2234-4314 (Online)

## **NATIONAL PROFESSIONAL COMMITTEES**

### **Major Role**

1. Keynote Speaker, International Semantics Intelligence Conference (ISIC), May, 2022
2. Keynote Speaker, 16th International *Conference* on Risks and Security of Internet and Systems. November, 2021. Ames, Iowa
3. Keynote Speaker, International Semantics Intelligence Conference (ISIC), February, 2021, New Delhi, India
4. Keynote Speaker, IEEE World AI Internet of Things (IOT) Congress, Seattle, 2021
5. Chairman of Workshop on Novelty in Open World, ISIC, 2021
6. Chairman, ML4SeC: Workshop on Machine Learning for Security and Cryptography, Istanbul, September, 2019, in conjunction with IEEE International Symposium on Personal, Indoor and Mobile Radio Communications
7. Award in honor of C. V. Ramamoorthy, committee member in IEEE Artificial Intelligence and Knowledge Engineering (AIKE) conference.
8. Best paper C.V. Ramamoorthy award chair, IEEE Symposium on Reliable Distributed Systems, 2018, Brazil
9. Best paper award chair, IEEE Cloud Conference, 2018, San Francisco
10. Organizing Committee, International Conference on Satellite and Telecommunication, September 2018, Stockholm, Sweden
11. Keynote Speaker, Artificial Intelligence Conference, April 2018, Las Vegas
12. Keynote Speaker, International Conference on Recent Innovation in Computing, March 2018, Jammu, India
13. Keynote Speaker, IEEE International Conference on Advanced Networks and Telecommunications Systems ( AINTS), December 2017, Bhubaneswar, India
14. Co-chair, International Symposium on Multi-media Security and Digital Forensic Conference, December 2017, Guangzhou, China
15. Co-chair, NSF conference on Network and Security (CanSec), October, 2017, Rolla, Missouri
16. General Conference Chair, Third International Symposium on Security in Computing and Communications ( SSCC-15), August, 2015, India

17. Conference chair, 2016 the 6th International Conference on Power and Energy Systems, Paris, France.
18. Keynote speaker, National conference on Recent Advances in Embedded Technologies at JIMS, April 2015, India
19. Keynote speaker, International Conference on advance Computing and Creating Entrepreneurs ( IACC), February, 2013, India
20. Keynote speaker, 9<sup>th</sup> IEEE International Conference on Heterogeneous Networking for Quality, Reliability, Security, and Robustness (Qshine) conference, January, 2013, India
21. Keynote speaker, IEEE International Advance Computing conference, February, 2013, India
22. Co-chair, International Conference on Advances in Computing, Communications and Informatics (ICACCI-2012), August 3-5, 2012, Chennai
23. Steering Committee for IEEE International Symposium on Wireless Pervasive Computing (ISWPC 2011), Hong Kong, 2011
24. Co-chair, Second IEEE International Workshop on Specialized Ad Hoc Networks and Systems (SAHNS 2010), Minneapolis, June, 2011
25. Advisory Committee, International Conference on Advanced Computing, Networking and Security (ADCONS 2011), NIT Karnataka, Surathkal
26. Advisory Committee, International Conference on High Performance and Grid Computing, 2011, Chitkara University, India
27. Advisory Committee, International Conference on Advances in Computing and Communication at NIT (Himachal)-India
28. Chair of Steering committee of IEEE Symposium on Reliable Distributed Systems (SRDS)
29. General Chair of the ACM/IET/ICST International Workshop on Performance and analysis of Wireless Networks, to be held in conjunction with The International Conference on Mobile Technology, Applications, and Systems (Mobility 2008), September, 2008, Ilan, Taiwan.
30. Co-Chair of the 2nd IEEE International Workshop on Broadband Wireless Internet Access, to be held in conjunction with the 4th IEEE International Conference on Wireless and Mobile Computing, Networking and Communications(WiMob 2008) October 12, 2008, Avignon, France
31. Co-chair of CRA-W sponsored workshop on Pervasive Computing, St Louis
32. Co-chair, First IEEE International Workshop on Specialized Ad Hoc Networks and Systems (SAHNS 2007), Toronto, Canada, June 29, 2007
33. IEEE Fellow Committee, 2004, 2005, 2006
34. PolyU's Distinguished Scholar, Hong Kong Polytechnic University 70th Anniversary
35. Keynote speaker at DEXA conference workshop, Krakow, Poland, 2006
36. Keynote speaker at International Conference on Distributed Computing and Internet Technology, Bhuvneshwar, India, 2004.
37. NSF PI workshop, Area Chair for Privacy & Trust Management, 2003 and 2004.

38. IEEE Computer Society' Technical Achievement Award Committee, 2003.
39. Invited Speaker, 14th International Workshop on Mobile Distributed Database System, Prague, September, 2003.
40. Keynote Speaker at International Conference on Advances in Computing and Communications (ADCOM), Bhuvneshwar, India, December 2001.
41. Chairman, IEEE workshop on Secure Mobile Systems, New Orleans, October 2001.
42. Keynote Speaker at Greece Database Conference, Ionina, Greece, May, 2001.
43. Invited Speaker at International Workshop on Mobility in Databases (MDDS-2000), London, September, 2000.
44. Invited Speaker at International Conference on Data Warehousing and Knowledge Discovery (DaWak-2000), London, September 2000.
45. Keynote Speaker at Database and Expert Systems (DEXA-99) conference, Florence, September 1999.
46. Chairman of 18th IEEE Symposium on Reliable Distributed Systems and Three Workshops on Multimedia, Security and Parallel and Dist. Systems, October 1998, Purdue University (156 attendees).
47. Invited Speaker at IEEE ASSET-98 Workshop, March 1998.
48. Chairman of the Steering Committee of the IEEE Symposium on Reliable Distributed Systems, 1995-1999. (Also Liaisons of the Technical Committee of Distributed Processing).
49. Keynote Speaker, Sixth International Conference on Databases and Expert Systems (DEXA-95), London, UK, September 1995.
50. Chairman of Workshop on Research Issues in Digital Libraries, in association with DEXA-95, London, September 1995.
51. Co-Chair of the NASA International Conference and Forum on Advances in Digital Libraries, Washington DC. (Jointly funded by NASA, ARPA, AT&T, BellCore and NSF), May 1995.
52. Co-Chair of the Rutgers-Purdue Workshop on Digital Libraries, Newark (jointly sponsored by funding from AT&T and BellCore), May 1994.
53. General Chair of the International Conference on Information and Knowledge Management, Gaithersburg, Maryland, November 1994.
54. Vice-chair of ISMM Conference on Parallel and Distributed Systems, Las Vegas, October 1994.
55. Program Chair of the IEEE Workshop on Parallel and Distributed Systems, Princeton, October 1993.
56. Invited Speaker in the International Conference on Intelligent and Cooperative Information Systems, Rotterdam, May 1993.
57. Tutorial Speaker in IEEE Symposium on Reliable Distributed Systems, Princeton, NJ, October 1993.
58. Program Chairman of the International Conference on Information and Knowledge Management, Washington DC, November 1993.

59. Invited Speaker, International Conference on Information and Knowledge Management, Baltimore, November 1992.
60. Co-Guest Editor of IEEE Computer (special issue on Object-Oriented Systems and Applications), October 1992.
61. Co-Program Chairman (with Nabil Adam) of the Rutgers-Purdue Workshop on Current Issues in Database Systems and Applications, Newark, October 1992.
62. Tutorial Speaker in IEEE Symposium on Reliable Distributed Systems, Houston, October 1993.
63. General Vice-Chair of the IEEE Technical Committee on Distributed Processing, January 1992-December 1993.
64. Invited Speaker at the Annual Conference of the Computer Society of India, October 1991, New Delhi, India.
65. Program Chairman of IEEE Computer Society's Workshop on Design Principles for Experimental Distributed Systems, October, 1986, Purdue University, West Lafayette. (A special issue of IEEE Transactions on Software Engineering in June, 1989 published selected papers that were presented at the workshop.)
66. Vice Chairman of Program Committee for Ninth IEEE Computer Society's Conference on Distributed Computing Systems, Newport Beach 1989. (Distributed Systems Architecture Track.)
67. American Liaison of Tenth IEEE Computer Society's Conference on Distributed Computing Systems, Paris, 1990.
68. Program Chairman of the IEEE Workshop on Experimental Distributed Systems, October 1990, Huntsville, Alabama.
69. Founding member of IEEE Data Engineering Conference Committee, 1985
70. Vice Program Chairman of IEEE Computer Society's Sixth International Conference on Distributed Computing Systems Conference, May 1986, Cambridge.
71. Vice Chairman of IEEE Computer Society's Technical Committee on Distributed Processing, (1982-1984).
72. Founder of IEEE Computer Society's Symposium on Reliability in Distributed Software and Database Systems. (Renamed Reliability in Distributed Systems). Program Chairman (July 1981), General Chairman (July 1982), and Program Committee Member (1983-1986, 1988-1989, 2004-2008) for IEEE Computer Society's Symposia on Reliability in Distributed Software and Database Systems.
73. Member of IEEE computer society Education Activity Board, (1982-1983)
74. Member of IEEE computer society Publication Board, (1981-1984)

**Member** of Program Committee of over two hundred international conferences (not listed in detail).

#### **International Activities (Various Years not in chronological order)**

1. Hosting a Ph.D student ( additional support for faculty exchange) from IIT under the SERB program of India-Purdue collaboration <https://globalpartners.purdue.edu/global-partnerships/india/overseas-visiting-doctoral-fellowship/>

2. Participation in Vaibhav program for India-US exchange of ideas among scientists ( organized by Indian Ministry of Science and Technology ( attended by 350 scientists from India and US for 6 sessions)
3. Contributed to funded proposals that were funded for collaborating with Ph.D students and their advisors in India (under the Anubhuti program)
4. Offered a series of lecture on security/privacy in networks, database systems in India ( attended by 300 persons) and China (attended by 30 students)
5. Hosting faculty, Ph.D students and Undergraduate from Switzerland, India, China
6. International Conference on High Performance and Grid Computing, Chitkara University, India
7. Chair, 4th International Workshop on Dependable Network Computing and Mobile Systems (DNCMS 2010) held in conjunction with SRDS 2010, India
8. Invited speaker at International Conference on System Integration, Brasilia, November, 2008
9. Seminars in Universities of Karlstad, Stockholm, Uppsala, Pierre and Madam Curie, EPFL (2008)
10. Visiting Professor in ETH and EPFL and University of Bern in Switzerland (several summers from 1991-2006).
11. Seminars in Cambridge, ETH, Technical University of Vienna, University of Klagenfurt, HIIT, Technical University of Berlin, Humboldt University. (2006-2008)
12. Chairman of the University's International Education Committee, June 1990-June 1991.
13. Invited Speaker, Computer Society of India, DEXA conference, ICDCI conference 1991, 1995, and 1999.
14. Member of University Advisory Committee on International Programs, September 1990-June 1991.
15. Consultant to University of Indonesia, November 1988-December 1988.
16. Invited Professor at Ecole Polytechnique Federal De Lausanne (EPFL), Various years
17. Invited Professor at ETH, Zurich, June -August 1991.
18. One Day Seminar to Swiss Industry Consortium, Lausanne, 1993.
19. Invited Speaker in the International Conference on Intelligent and Cooperative Information Systems, Rotterdam, Netherlands, May, 1993.
20. One Day seminar at EPFL for Industry and Academics, June 1994.
21. Invited Speaker in the International Conference on System Integration, San Paulo, Brazil, August, 1994.
22. Keynote Speaker in the Sixth International Conference on Databases and Expert Systems, London, September 1995.
23. Organizer of a Workshop on Advances in Digital Libraries in the Sixth International Conference on Database and Expert Systems, London, September 1995.
24. Invited Professor, University of Klagenfurt, Austria, 1999.
25. Establishing Collaborative Program with ETH and EPFL, Switzerland, 2001.

26. Seminar in University of Bern and EPFL, 2003.
27. Keynote Speaker, International Workshop on Distributed Computing and Internet Technology, Bhubaneswar, India, 2004.
28. Keynote speaker, DEXA Workshop on Security and Privacy, Krakow, 2006
29. Tutorials on Privacy, Helsinki University and HIIT, 2006
30. Colloquia in Humboldt University and ETH, Zurich, 2007
31. PolyU's Distinguished Scholar, Hong Kong Polytechnic University 70<sup>th</sup> Anniversary
32. Hosted Ph. D students from University of Bern, Universities in Korea, and Humboldt University, 2008

### **TEACHING Graduate and Undergrad (Last few years)**

College of Science nominee for Murphy award (highest in Purdue for undergrad teaching)

1. CS 590: (Situation Awareness, Adversarial ML and Explainable AI) Develop tools and systems that apply ML to real applications on real data and try to deal with attacks and explain the decisions of AI powered decision making. In addition, the seminar will discuss methods to make these tools more efficient and more accessible. ( Fall 2020) ( Student Evaluation 3.92/4.0)
2. CS 542: (Distributed Database Systems). Seven new projects have been created on Video Conferencing, Communications, Multi-media, Digital Libraries, and Mobile Databases, Web Caching, Server less Computing. The course has changed to deal with distributed computing in new emerging applications and technologies. (Started in 1985 and offered many times) ( Student evaluation 4.7-4.9/5.0)
3. CS 348: (Information System). I revised the course content and taught it as nuts and bolts of technologies that are needed for building information systems. This included physical and logical design of information systems, data mining, database warehouses, cooperative information systems, interoperability, and commercial systems. I brought outside speakers and arranged a visit to a local company. (Student Evaluations 4.5/5.0)
4. CS 448: (Introduction to Database Systems). Updated the course by introducing concepts of Object-Oriented, Client-Server, and multi-media databases. (Student Evaluations 4.8/5.0)
5. CS 490 ( Emerging Technologies and Fundamental of Computer Science), Seminar for Minorities in non-CS majors, offered in last three semesters (Student Evaluations 4.9/5.0)
6. CS 690B: (Research Seminar on Cloud Systems for Blind and Hearing Impaired). Fall 2010, first offering.
7. CS 641: (Multimedia Database Systems). Fall, 2008 first offering. Covers topics such as Digital Libraries, Video Conferencing, Mobile MM Support (3G, 4G systems), QoS, Media Streaming
8. Seminars at other Universities and Thesis Committees: I have served on Ph.D. Committees, offered Ph.D. seminars and helped graduate students in EPFL, Lausanne,

ETH, Zurich, and Rutgers University, Queens and James Cook University, South Africa, I.I.T Delhi, Humboldt University, Berlin, and University of Berlin, Germany, India

## **2. Tutorials at International Conferences and Institutes**

9. I have organized tutorial notes on several topics (a) Configurable Distributed Database Systems: Living with Failures and Surviving Catastrophes, (b) Reliability and Performance Evaluation of Distributed Database Systems, (c) Communication Facilities for Transaction Processing, and (d) Privacy and Security (Recently offered in Fall 2020 to 300 students/faculty in Internationally organized seminars)
10. These have been published by IEEE and EPFL, Lausanne and have been presented to various industry groups and conference attendees. ( Presentations 40 hour course to 250 faculty in India and another 40 hour course in a major university in China)

## **3. Undergraduate (extra activities, Various Years)**

11. Advising CS honor student (2020)
12. Independent study by eight undergraduates ( in lieu of CS 490 course)
13. Hosting interns from IIT ( last few summers)
14. Freshman Honors seminar.
15. Active in contacting high school students who are prospects for the freshman class of school of science and served on the awards committee. Meeting students and families of prospective freshman
16. Helping minority students in school of science (voluntarily) in Computer Science courses. Member of the School of Science Minority Affairs Committee. Member of the Horizon program to retain minorities. Member of Undergrad School of Science Research Committee.
17. CS 490 (Independent Study): Have supervised 8 undergraduate students who have mainly worked in Raid laboratory and were funded through NSF and AT&T grants. Three students currently supported by NSF REU grant.

## **Postdocs**

1. Dr. Sanjay Madria (1998-2000)
2. Dr. Ladjel Bellatreche (2000)
3. Dr. Malika Mahoui (2000-2001)
4. Dr. I Young Chung (2001-2002)
5. Dr. Florian Baumgartner (2002)
6. Dr. Mamata Jenamani (2003-2004)
7. Dr. Leszek Lilien (2002-2006)
8. Dr. Xiaoxin Wu (2002-2005)
9. Dr. Wen Zen (2003-2004)
10. Dr Jungho Huh (2006-2010)
11. Dr. Ruy Olivier (2007-2009)
12. Dr. Rui Jiang ( 2013-2015)

13. Dr. Gong Tao (2012-2014)
14. Dr. Hongsong Chen ( 2014-2016)
15. Dr JunSong Fu ( 2018-2020)
16. Sikai Chen ( 2020-) with Prof. Sam Labi in Civil Engineering)

**Ph.D. Students (Graduated or Passed the Qualifier Examination)**

*Major Advisor*

1. Cecil Hua, ``Verification of Concurrency Control Algorithms for Distributed Database Systems,” (1979-1981). (Employed at IBM.)
2. Leszek Lilien, ``Integrity in Database Systems,” (1980-1983). (Faculty at Western Michigan University.)
3. Zwang Ruan, ``Replication in Distributed Systems,” (1984-1986) (Motorola, China)
4. John Riedl, ``Formal Models and Implementation of Adaptable Distributed Systems,” (from 1985-1989). (Professor at University of Minnesota.)
5. Pei-Jyun Leu, ``Consistent State Detection and Recovery for Concurrent Processing,” (from 1986-1988.) (Employed at Hewlett Packard Corporation.)
6. Shy Renn Lian, ``Global State Detection in Distributed Systems,” (from 1986-1990). (Employed at AT&T Corporation.)
7. Enrique Mafla, ``Transaction Processing in Operating System Kernel,” (from 1988-1990). (Professor at a University of Ecuador.)
8. Shirley Browne Moore, ``Recovery in Replicated Database Systems,” (1988-1990). (Faculty at University of Texas at El Paso)
9. Sumi Helal, ``Adaptability to failures in Distributed Systems,” (1988 -1991). (Professor at University of Florida.)
10. Srinivasan Jagannathan, ``Composite Object Replication in Distributed Database Systems,” (from 1988-1992). (Employed at Oracle Corporation.)
11. Yin-he Jiang, ``Enhancements to Relational Database Systems,” (from 1990-1994). (Employed at Oracle Corporation.)
12. Yongguang Zhang, ``Communications in Large Scale Distributed Systems,” (from 1990-1994). (Microsoft Research)
13. Aidong Zhang, ``Maintaining Consistency in Multi-databases,” (from 1993-1994). (Distinguished Professor at SUNY Buffalo and now chair professor at University of Virginia)
14. Evaggelia Pitoura, ``Advanced Transaction Model and Relaxed Consistency Criterion for Mobile Environments,” (from 1993 -1995). (Professor at University of Ioannina in Greece.)
15. Xiangning Liu, ``Experimental Study of Data Communication and Replication for Transaction Processing over Large Number of Distributed Sites,” (from 1993 -1995). (Employed in Sybase Corporation.)
16. Shunge Li, ``Experiments in Multi-media Object Oriented Systems,” (from 1993-1997). (VP at Wistron AiEdge Corporation.)
17. Shalab Goel, ``Concurrency and Coherency Control in Shared Disk Parallel Database Systems,” (from 1995-2000). (Employed at GE Digital)

18. Melli Annamalia, ``Context-based Retrieval in Digital Image Libraries,” (from 1993-1997). (Employed at Oracle Corporation.)
19. Sheng-Yih Wang, ``Adaptable Video-Audio Conferencing,” (from 1995-2000). (Principal Engineer at Palo Alto Networks.)
20. Ahsan Habib, ``Active Networks and DiffServ,” (from 2000-2003). (Employed as VP at Telenav, Santa Clara).
21. Mohamed Hefeeda, ``Multimedia Streaming,” (from 2001-2004). (Director of CS at Simon Fraser University, Canada).
22. Yi Lu, ``Adhoc Networks,” (from 2000-2004). (Employed at Microsoft Corporation.)
23. Yuhui Zhong, `` Formalization of Trust,” (from 2001-2005). (Employed at Microsoft Corporation.)
24. Weichao Wang, ``Secure Routing in Wireless and Mobile Networks,” (from 2002-2006). (Head of department at Univ of North Carolina, Charlotte)
25. Gang Ding, ``Cross-layer Algorithms for Mobile Wireless Networks,” (from 2002 - 2006).(Employed at Olympus Communication Technology of America)
26. Ahmet Burak Can, ``Trust and Anonymity in Peer to Peer Systems,” (from 2004 -2007). (Faculty at Hacettepe University, Turkey.)
27. Amit Sirsat, ``Self-Configuration Algorithms for Mobile Adhoc Networks,” (from 2004 - 2008). (Employed at Apple Corporation)
28. Yu Zhang, `` Analysis of Port Scanning Attacks,” (from 2006-2009). (Employed at Google)
29. Nwokedi Idika, ``Security Measures” (from 2007-2010) ( Employed at Google)
30. Pelin Angin, ``Autonomous Agent-Based Mobile-Cloud Computing” (from 2009-213) (Employed at Middle Eastern Technical University, Turkey)
31. Ruchith Fernando, Privacy In Social Messaging And Identity Management ( from 2011-2014) (Employed at Amazon)
32. Rohit Ranchal, “Cross-Domain Data Dissemination and Policy Enforcement” ( from 2010-2015) ( Employed at Amazon Corporation)
33. Norman Ahmed, “Design, Implementation and Experiments in Moving Target Defense” ( from 2010-2016) ( Employed at Air Force Research Laboratory)
34. Mehdi Azarmi, “End-to-End Security in Service-oriented-architecture ( from 2010-2016) (Employed in Salesforce Corporation)
35. Denis Ulybyshev, Privacy preserving Data Dissemination ( from 2015-2019) ( Employed at University of Tennessee, Cooksville)
36. Amber Johnson, Wearable device Security ( from 2014-2019) ( Employed at Northrup Grumman Corporation)
37. Miguel Villarreal-Vasquez, Anomaly Detection and Secure Deep Learning Algorithms under Adversarial Situations ( from 2016-2020) (Employed at Amazon)
38. Ganapathy Mani, Deep learning Based Models for Autonomy and Cybersecurity Intelligence in Autonomous System ( from 2016-2020) (Employed at Qualcomm)
39. Servio Ernesto Palacios Interiano, Auditable Computations on (Un)Encrypted Graph-Structured Data (from 2017-2020) (Employed in startup, QLever.io)

40. Alina Nesen, Anomaly Detection in Multi-modal Data with Semantic Analysis, Passed Prelim Ph. D (from 2018-)
41. K.A.L. Solaiman, Explainable Embedding-based Representation of Data Objects for Augmented Semantic Search, Passed Prelim Ph.D (from 2018-)
42. Marina Wagdy Wadea Haliem, Novelities in Ride sharing games and Reinforcement Learning, Passed Prelim, Ph.D (from 2018-)
43. Aala Oqab Alsalema, Optimization of Multi-agent games, Passed Qualifier for Ph.D (2018-)
44. Mijanur Palash, Video analysis to detect Autism and Mental Problems, Passed Prelim Ph.D for Ph.D (2020-)
45. Trevor Bonjour, Multiagent Game simulation and Novelty Detection, Passed Qualifier for Ph.D ( 2020-)
46. M. Shamshul Kaonain, Software Defined Networks and Novelty in AI (2021-)
47. S. Islam, Security and ML to discover Novelities and adaptation in AI systems (2022-)

## **Service**

### **1. University Wide Committee (Various Years)**

1. Senator for Purdue faculty, 2016- now
2. Member of Purdue Select Committee regarding sexual assault and misconduct on campus
3. Member of Equity and Diversity committee of Purdue Senate, 2016- now
4. Member of Education and Policy committee of Purdue Senate, 2017-2019
5. Member of Military Education committee of Purdue Senate, 2015-now
6. Mentor for Emerging Leaders Science Scholars program
7. Disability center subcommittee to mentor students in CS
8. Member of the University International Education Committee for three years, Chairman.
9. School of Science representative for the University Advisory Committee on International Programs.
10. School of Science Committee for evaluating PRF XL grants
11. Participant in Mentor Program for minority students (Horizon) 1992- now.
12. Member Faculty of the Interdisciplinary Program on Geographical Information. Systems and Remote Sensing, 1984- now.
13. Participant in the Aviation Safety Center Planning Group, (with Ernest Agee of EAS and Warren Stevenson of EE and faculty from technology, Engineering).
14. Participant in the proposal to NSF for Multimedia Technology for Education, 1994-(with Ed Coyle of EE and faculty from Agriculture, Education schools).
15. Reviewer of Global Initiative Faculty Grants
16. Indiana Partnership for State wide Peer Review Committee on Computer Science (Coordinator Dr. Clinton Fuelling at Ball State and Prof. Phil Swain).
17. School of Science (Grievance Committee)

18. School of Science (PRF grants for Faculty review Committee)
19. School of Science (Undergraduate Research Day Committee)
20. Member of Asia Studies Program Taskforce.
21. Evaluation Committee of Lilly Foundation Awards/Proposal under the Executive Vice President's office.
22. Horizon Program (For retaining brilliant minority students).
23. GE Fellowship Evaluation Committee for Minorities and Women.
24. Distant Learning Committee of the University.
25. School of Science (Minority Affairs Committee), 1996-2003.
26. School of Science Council, 2001-2005.
27. School of Science (Minority Faculty Recruiting), 2004-2006.
28. Proposal Writing and Presentation for Regenstrief Health Care Engineering Center (RCHE) establishment
29. School of Science Area Committee for Promotions

## **2. Departmental Committee (Various Years)**

22. MS admission Committee (2020-2022)
23. Advisor ACM student chapter
24. Captain United Way ( 2017-2020)
25. Internal Advisory Board of Purdue Center for Educational & Research in Information Assurance & Security (CERIAS)
26. Chairman of Diversity Committee
27. Space Management Committee
28. Graduate Committee
29. Department Head Advisory Committee-Elected by faculty.
30. Colloquia Chairman
31. Faculty Advisor to Association of Computing Machinery (ACM)
32. Faculty Advisor to Indian Students Association
33. Awards Committee.
34. Undergraduate Committee.
35. Promotion Committee.
36. EE Liaison.
37. Industrial Affiliate Committee.
38. CS690S Seminar for New Graduate Students.
39. CS 195 Freshman Honors Seminar.
40. Senate Committee to Prevent Sexual Assault

41. Mentor Emerging Leaders Science Scholars

**3. Others**

42. West Lafayette High School (Book selection Committee).

43. Happy Hollow School (Organizer of International Night).

44. Five year review of Computer Science department, Western Michigan University, November

45. Establishing Information Assurance program at Monmouth College.

**Government Service (Various Years)**

1. Committee for NASA (USRA) for Evaluating Architecture of Embedded Distributed Network Systems

2. Providing Consulting Services to NIST for the Remote Data Access (RDA) protocol for integrating commercial databases over wide area networks

3. Committee for writing guidelines and specifications for Data Integration and Distribution with Mr. Bill Wong member from DISA (Defense Information Systems Architecture), Department of Defense.

4. Panel Member: National Science Foundation

5. Panel Member: NASA CAN for Public Use of Earth and Space Science Data over the Internet work

6. Reviewer of proposals from Army Research Lab, NASA

7. Invited Participant at ARPA meeting in St. Louis.

8. AFRL/Navy faculty fellow

9. Special Projects for NSF (Large projects)

10. Reviewer, US State Department (Russia program)

11. Reviewer, US Department of Transportation