

Dianxiang Xu

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EDUCATION

Ph.D.(1995), M.S.(1992), B.S.(1989), Computer Science, Nanjing University, China

RESEARCH INTERESTS

Software security, software testing, applied formal methods, software agents.

TEACHING INTERESTS

Software engineering, software testing, software security, software construction, computer forensics, formal methods for software development, programming languages, operating systems concepts, artificial intelligence, database systems, computer science I, II, etc.

EMPLOYMENT

- May 2009 - present. Associate Professor, National Center for the Protection of the Financial Infrastructure, Dakota State University
- July 2003 – May 2009. Assistant Professor, Department of Computer Science, North Dakota State University
- August 2000 – July 2003. Research assistant professor/engineer, Department of Computer Science, Texas A&M University
- May 1999 – August 2000. Research associate, School of Computer Science, Florida International University
- July 1998 – May 1999. Associate department head, Department of Computer Science and Technology, Nanjing University
- March 1998 – November 2000. Associate professor, Department of Computer Science and Technology, Nanjing University (On leave from May 1999 to November 2000)
- July 1995 – February 1998. Assistant professor, Department of Computer Science and Technology, Nanjing University

SELECTED PUBLICATIONS

Journal Articles

1. Dianxiang Xu, Omar El Ariss, Weifeng Xu, Linzhang Wang, Aspect-Oriented Modeling and Verification with Finite State Machines, *Journal of Computer Science and Technology*, 24(5): 949-961, Sept. 2009.
2. Dianxiang Xu, Weifeng Xu and W. Eric Wong, Automated Test Code Generation from Class State Models, *International Journal of Software Engineering and Knowledge Engineering*, 19(4): 599-623, June 2009.

3. Jun Kong, Kang Zhang, Jing Dong, and Dianxiang Xu, Specifying Behavioral Semantics of UML Diagrams Through Graph Transformations, *Journal of Systems and Software*, 82(2): 292-306 (2009).
4. Dianxiang Xu, Weifeng Xu, and W. Eric Wong, Testing Aspect-Oriented Programs with UML Design Models, *International Journal of Software Engineering and Knowledge Engineering*, Vol. 18, No. 3, pp. 413-437, May 2008.
5. Dianxiang Xu, Vivek Goel, Kendall Nygard, and W. Eric Wong. Aspect-Oriented Specification of Threat-Driven Security Requirements, *International Journal of Computer Applications in Technology, Special Issue on Concern Oriented Software Evolution*, Vol. 31, Nos. 1/2, pp. 131-140, 2008.
6. Martin C. Lundell, Dianxiang Xu, Denver Tolliver, and Kendall E. Nygard. A Multi-Agent Design for Sense and Respond Logistics Simulation, *World Review of Intermodal Transportation Research*, Vol. 1, No. 4, pp. 459-471, 2007.
7. Junhua Ding, Dianxiang Xu, Yi Deng, Peter J. Clarke, Xudong He. A Formal Model-Based Approach for Developing an Interoperable Mobile Agent System. *Multi-Agent and Grid Systems: An International Journal. Special issue on Agent-oriented Software Development Methodologies*. Volume 2, Number 4, pp. 401-412, 2006.
8. Dianxiang Xu and Josh Pauli. Threat-Driven Design and Analysis of Secure Software Architectures. *Journal of Information Assurance and Security*, Vol.1, No.3, pp. 171-180, 2006.
9. Dianxiang Xu and Kendall E. Nygard. Threat-Driven Modeling and Verification of Secure Software Using Aspect-Oriented Petri Nets. *IEEE Transactions on Software Engineering*. Vol. 32, No. 4, pp. 265-278, April 2006.
10. Dianxiang Xu, Richard A. Volz, Michael S. Miller, and Jesse Plymale. Knowledge-Based Human-Agent Teamwork for Distributed Training. *International Journal of Intelligent Control and Systems*. Vol. 11, No. 1, pp. 1-10, March 2006.
11. Junhua Ding, Dianxiang Xu, Xudong He, and Yi Deng. Modeling and Analyzing a Mobile Agent-based Clinical Information System. *International Journal of Intelligent Control and Systems*. Vol. 10, No. 2, pp. 143-151, June 2005.
12. Sen Cao, Richard A. Volz, Jamison Johnson, Maitreyi Nanjanath, Jonathan Whetzel, and Dianxiang Xu, Development of a Distributed Multi-Player Computer Game for Scientific Experiment of Team-Training Protocols, *The Electronic Library – The Int. J. for the Applications of Technology in Information Environments*, Vol. 22 No. 1, pp. 43-54, 2004.
13. Dianxiang Xu, Richard A. Volz, Thomas R. Ioerger, and John Yen, Modeling and Analyzing Multi-Agent Behaviors Using Predicate/Transition Nets, *International Journal of Software Engineering and Knowledge Engineering*, Vol. 13, No. 1, pp.103-124, February 2003.
14. Dianxiang Xu, Jianwen Yin, Yi Deng, and Junhua Ding, A Formal Architectural Model for Logical Agent Mobility, *IEEE Transactions on Software Engineering*, Vol.29, No.1, pp. 31-45, 2003.
15. Dianxiang Xu, Xudong He, and Yi Deng, Compositional Schedulability Analysis of Real Time Systems Using Time Petri Nets, *IEEE Transactions on Software Engineering*, vol.28, no.10, pp. 984-996, October 2002.
16. Xiaocong Fan, Dianxiang Xu, Jianmin Hou, and Guoliang Zheng, Reasoning about Concurrent Actions in Multi-Agent Systems, *Journal of Computer Science and Technology*, vol.14, no.4, pp. 422-428, July 1999.
17. Dianxiang Xu, Guoliang Zheng, and Xiaocong Fan, A Logic Based Language for Networked Agents, *Information and Software Technology*, vol.40, no.8, pp. 435-442, August 1998.
18. Dianxiang Xu, Towards an Object-Oriented Logic Framework for Knowledge Based Systems, *Knowledge Based Systems*, vol.10, no.6, pp. 351-358, April 1998.

19. Dianxiang Xu and Guoliang Zheng, Towards a Declarative Semantics of Inheritance with Exceptions, *Journal of Computer Science and Technology*, Vol.11, No.1, pp. 61-71, 1996.
20. Jingui Pan, Shifu Chen, Dianxiang Xu, and Zhaoqian Chen, A Framework for Intelligent Decision Support System, *Chinese Journal of Advanced Software Research (In English)*, vol.2, no.1, pp. 21-27, March 1995.
21. Dianxiang Xu, Jingui Pan, Shifu Chen, and Zhaoqian Chen, A Knowledge Based Model Description Language, *Chinese Journal of Advanced Software Research (In English)*, vol.1, no.4, pp. 391-396, December 1994.

Book Chapters

22. Dianxiang Xu, Software Security, *Wiley Encyclopedia of Computer Science and Engineering*, B. W. Wah (Editor-In-Chief), Volume 5, pages 2703-2716, John Wiley & Sons, Inc., Hoboken, NJ, January 2009.

Conference/Workshop Papers

23. Sathish Pinagapani, Dianxiang Xu, and Jun Kong, A Comparative Study of Access Control Languages, *Proc. of the 3rd IEEE International Conference on Secure Software Integration and Reliability Improvement (SSIRI'09)*, Shanghai, China, July 8-10, 2009.
24. Aaron Marback, Hyunsook Do, Ke He, Samuel Kondamarri, Dianxiang Xu, Security Test Generation using Threat Trees, *Fourth International Workshop on the Automation of Software Test (AST'09)*, in conjunction with ICSE'09, Vancouver, Canada, May 18-19, 2009.
25. Weifeng Xu and Dianxiang Xu, Automated Evaluation of Runtime Object States Against Model-Level States for State-Based Test Execution, *The 5th Workshop on Advances in Model Based Testing (A-MOST'09)*, in conjunction with ICST'09, Denver, Colorado, USA, April 1st, 2009.
26. Zhanqi Cui, Linzhang Wang, Xuandong Li, and Dianxiang Xu. Modeling and Integrating Aspects with UML Activity Diagrams, *Proc. of the 24th ACM Symposium on Applied Computing (SAC'09)*, Software Engineering Track, pp. 430-437, March 8-12, 2009, Hawaii, USA.
27. Omar El-Ariss, Dianxiang Xu, W. Eric Wong, Yuting Chen, Yann-Hang Lee, A Systematic Approach for Integrating Fault Trees into System Statecharts, *Proc. of the 32nd IEEE Computer Software and Applications Conference (COMPSAC 2008)*, pp. 120-123, July 2008, Turku, Finland.
28. Jun Kong and Dianxiang Xu. A UML-based Framework for Design and Analysis of Secure Software, *Proc. of the 32nd IEEE Computer Software and Applications Conference (COMPSAC 2008)*, pp. 28-31, July 2008, Turku, Finland.
29. Kendall E. Nygard, Dianxiang Xu, Jonathan Pikalek, and Martin Lundell, Multi-agent Designs for Ambient Systems, *Proc. of the First International Conference on Ambient Media and Systems (Ambi-sys'08)*, Quebec City, Canada, Feb. 2008.
30. Dianxiang Xu, Weifeng Xu, and W. Eric Wong. Automated Test Code Generation from UML Protocol State Machines, *Proc. of the 19th International Conference on Software Engineering and Knowledge Engineering (SEKE'07)*, pp. 99-104, Boston, July 2007. One of the top rated papers invited for journal submission.
31. Dianxiang Xu, Izzat Alsmadi, and Weifeng Xu, Model Checking Aspect-Oriented Design Specification, *Proc. of the 31st IEEE International Computer Software and Applications Conference (COMPSAC'07)*, Vol. 1. pp. 491-500, Beijing, July 2007.
32. Linzhang Wang, W. Eric Wong, and Dianxiang Xu. A Threat Model Driven Approach for Security Testing, *The 3rd International Workshop on Software Engineering for Secure Systems (SESS07)*, in conjunction with ICSE'07. May 2007, Minneapolis.

33. Dianxiang Xu and Xudong He. Generation of Test Requirements from Aspectual Use Cases. *Proc. of the Third Workshop on Testing of Aspect-Oriented Programs (WTAOP'07)*. In conjunction with AOSD'07, pp. 17-22, March 2007, Vancouver, Canada.
34. Dianxiang Xu, Vivek Goel, and Kendall Nygard. An Aspect-Oriented Approach to Security Requirements Analysis. *Proc. of the 30th IEEE International Computer Software and Applications Conference (COMPSAC'06)*, pp. 79-82, Chicago, Sept. 2006.
35. Josh Pauli and Dianxiang Xu. Integrating Functional and Security Requirements with Use Case Decomposition. *Proc. of the 11th IEEE International Conference on Engineering of Complex Computer Systems (ICECCS'06)*, pp. 57-66, USA, August 2006.
36. Weifeng Xu and Dianxiang Xu. State-Based Testing of Integration Aspects. *Second Workshop on Testing of Aspect-Oriented Programs (WTAOP'06)*. In conjunction with ISSTA'06, pp. 7-14, July 2006.
37. Josh Pauli and Dianxiang Xu. Ensuring Consistent Use/Misuse Case Decomposition for Secure Systems. *Proc. of the 18th International Conference on Software Engineering and Knowledge Engineering (SEKE'06)*, pp. 392-397, CA., USA, July 2006.
38. Dianxiang Xu and Weifeng Xu. State-Based Incremental Testing of Aspect-Oriented Programs. *Proc. of the 5th International Conference on Aspect-Oriented Software Development (AOSD'06)*, pp. 180-189, March 20-24, 2006. Bonn, Germany. ACM Press.
39. Dianxiang Xu and Kendall Nygard. A Threat-Driven Approach to Modeling and Verifying Secure Software. *Proc. of the 20th IEEE/ACM International Conference on Automated Software Engineering (ASE'05)*, pp. 342-346, November 7-11, 2005. California, USA. ACM Press.
40. Josh Pauli and Dianxiang Xu. Threat-Driven Architectural Design of Secure Information Systems. *Proc. of the 7th International Conference of Enterprise Information Systems (ICEIS'05)*, pp. 136-143, Miami, May 2005.
41. Dianxiang Xu, Weifeng Xu, and Kendall Nygard. A State-Based Approach to Testing Aspect-Oriented Programs. *Proc. of the 17th International Conference on Software Engineering and Knowledge Engineering (SEKE'05)*, pp. 366-371, July 14-16, Taiwan.
42. Junhua Ding, Dianxiang Xu, Yi Deng, Peter J. Clarke, Xudong He. Design an Interoperable Mobile Agent System Based on Predicate Transition Net Models. *Proc. of the 17th International Conference on Software Engineering and Knowledge Engineering (SEKE'05)*, pp. 560-565, July 14-16, Taiwan.
43. Josh Pauli and Dianxiang Xu. Trade-off Analysis of Misuse Case-based Secure Software Architectures: A Case Study. *Proc. of the 3rd International Workshop on Modeling, Simulation, Verification and Validation of Enterprise Information Systems (MSVVEIS'05)*, pp. 89-95, Miami, May 2005.
44. Wu-Jun Li, Chong-Jun Wang, Dian-Xiang Xu, Bin Luo, and Zhao-Qian Chen. A Study on Illumination Invariant Face Recognition Methods Based on Multiple Eigenspaces. *Proc. of ISNN'05*, LNCS 3497, China, May 2005.
45. Dianxiang Xu and Vivek Goel. An Aspect-Oriented Approach to Mobile Agent Access Control. *Proc. of the 2005 International Conference on Information Technology: Coding and Computing (ITCC'05)*, Vol. I, pp. 668-673. IEEE Computer Society, Las Vegas, April 2005.
46. Josh Pauli and Dianxiang Xu. Misuse Case-Based Design and Analysis of Secure Software Architecture. *Proc. of the 2005 International Conference on Information Technology: Coding and Computing (ITCC'05)*, Vol. II, pp. 398-403, IEEE Computer Society, Las Vegas, April 2005.
47. Weifeng Xu and Dianxiang Xu. A Model-Based Approach to Test Generation for Aspect-Oriented Programs. *First Workshop on Testing Aspect-Oriented Programs (WTAOP'05)*, in conjunction with AOSD'05, Chicago, March 2005.

48. Wujun Li, Chongjun Wang, Dianxiang Xu, and Shifu Chen. Illumination Invariant Face Recognition Based on Neural Network Ensemble. *Proc. of the 16th IEEE International Conference on Tools with Artificial Intelligence (ICTAI'04)*, pp.486-490, IEEE Computer Society, Florida, Nov. 2004.
49. Dianxiang Xu, Priti Borse, Ken Grigsby, and Kendall. E. Nygard. A Petri Net Based Software Architecture for UAV Simulation. *Proc. of the International Conference on Software Engineering Research and Practice (SERP04)*. vol. 1, pp. 227-232, Las Vegas, USA, June 2004. CSREA Press, ISBN 1-932415-28-9.
50. Dianxiang Xu, Richard A. Volz, Michael S. Miller, and Jesse Plymale. Human-Agent Teamwork for Distributed Team Training. *Proc. of the 15th IEEE International Conference on Tools with Artificial Intelligence (ICTAI'03)*, pp. 602-607, IEEE Computer Society, Sacramento, November 2003.
51. Sen Cao, Richard. A. Volz, Jamison Johnson, Maitreyi Nanjanath, Jonathan Whetzel, and Dianxiang Xu, Development of a Distributed Multi-Player Computer Game for Scientific Experiment of Team-Training Protocols, *Proc. of the 2nd International Conference on Application and Development of Computer Games (ADCOG'03)*, Hong Kong, January 2003.
52. Dianxiang Xu, Richard A. Volz, Thomas R. Ioerger, and John Yen, Modeling and Verifying Multi-Agent Behaviors Using Predicate/Transition Nets, *Proc. of the 14th International Conference on Software Engineering and Knowledge Engineering (SEKE'02)*, pp. 193-200, Italy, July 2002.
53. John Yen, Jianwen Yin, Thomas R. Ioerger, Michael S. Miller, Dianxiang Xu, and Richard A. Volz, CAST: Collaborative Agents for Simulating Teamwork, *Proc. of the 17th International Joint Conference on Artificial Intelligence (IJCAI'01)*, pp. 1135-1142, Seattle, August 2001.
54. Dianxiang Xu and Yi Deng, Modeling Mobile Agent Systems with High Level Petri Nets, *Proc. of the IEEE International Conference on Systems, Man, and Cybernetics (SMC'00)*, pp. 3177-3182, Nashville, October 2000.
55. Xiaocong Fan, Dianxiang Xu, and Guoliang Zheng, Reasoning about Inheritance and Cloning Behaviors of Software Agents. *Proc. of the International Conference on Technology of Object-Oriented Languages and Systems (TOOLS31)*, pp. 77-82, China, Sept. 1999.
56. Xiaocong Fan, Dianxiang Xu, and Guoliang Zheng, Some Formal Proposals for Team Tracking, *Proc. of the International Conference on Computational Intelligence and Multimedia Applications (ICCI'98)*, pp. 228-234, World Scientific Publisher, Australia, 1998.
57. Dianxiang Xu and Guoliang Zheng, Typed Logic Objects with Non-monotonic Inheritance. *Proc. of the 9th International Conference on Software Engineering and Knowledge Engineering (SEKE'97)*, pp. 472-478, Madrid, Spain, June 1997.
58. Xiaocong Fan, Dianxiang Xu, and Guoliang Zheng, Reasoning about Team Tracking, *Proc. of the International Symposium of New Technology on Computer Software for Young Chinese Scholars (NTCS/W-97)*, pp. 179-184, International Academic Publishers, China, September 1997.
59. Dianxiang Xu and Guoliang Zheng, A Declarative Semantics for Negative Rules, *Proc. of the 1995 Pacific-Asian Conference on Expert Systems (PACES'95)*, pp.139-142, China, May 1995.
60. Shifu Chen and Dianxiang Xu, A Knowledge Based Model Description Language for Decision Support, *Proc. of the 6th International Conference on Tools with Artificial Intelligence (ICTAI'94)*, pp. 696-699, IEEE Computer Society Press, New Orleans, USA, Nov. 1994.
61. Dianxiang Xu, Jingui Pan, and Guoliang Zheng, A Hybrid Knowledge Representation Based on Logical Objects, *Proc. of the Second IEEE International Conference on Expert Systems for Development*, pp. 153-158, IEEE Computer Society Press, March 1994.
62. Xu Dianxiang and Chen Shifu, NUIDSST: A Development Tool for Decision Support Systems, *Proc. of the IFAC Workshop on Expert Systems in Agriculture*, pp. 92-95, International Academic Publishers, August 1992.

63. Pan Jingui, Xu Dianxiang, and Chen Shifu, The Expert System of the Neotectonic Control of the Karst Fissure Water Resources and Its Applications in Agriculture, *Proc. of the IFAC Workshop on Expert Systems in Agriculture*, pp. 145-147, International Academic Publishers, August 1992.

RESEARCH GRANTS AND CONTRACTS

- “II-NEW: Infrastructure for Model-Based Security Testing, Controlled Experiments, and Education, NSF CRI, \$220,000, September 1, 2009 – August 31, 2011, Hyunsook Do (PI, NDSU) and Dianxiang Xu.
- “A Multi-User Virtual Biology Environment for Discovery-Oriented Science Education”, NIH SBIR Phase I, \$100,000, April 15, 2008 – Sept. 14, 2008, Bradley Vender (PI) and Brian Slator (WoWiWe Instruction Co.), Phillip McClean and Dianxiang Xu (NDSU).
- “Testing for Software Safety”, NASA OSMA/SARP Center Initiatives, \$407,500, January 2007 – December 2009, PI: Ken Chen (Johnson Space Center), Co-PIs: Yann-Hang Lee (Arizona State University), W. Eric Wong (University of Texas at Dallas), Dianxiang Xu (North Dakota State University).
- “Automated Generation of Safety Tests”, ND NASA EPSCoR through NASA grant #NNX07AK91A, \$18,729, November 2007 – August 2008, PI: Dianxiang Xu
- “Model-Checking Aspect-Oriented Design Specifications”, ND EPSCoR IIP-SG through NSF Grant EPS-047679, \$15,000, October 2006 – April 2007. PI: Dianxiang Xu.
- “Model-Based Testing of Aspect-Oriented Software”, ND NASA EPSCoR through NASA Grant NCC5-582. \$13,750. April 2006– July 2006. PI: Dianxiang Xu.
- “Internet-Based Software Agents and Their Applications in Electronic Commerce”. National Hi-Tech Research & Development Plan of China (863). RMB Yuan 300,000. November 1998 – December 2000. PI: Dianxiang Xu.
- “Concurrent Behaviors and Non-monotonic Inheritance of Intelligent Agents”. Natural Science Foundation of China. RMB Yuan 100,000. January 1997 – December 1999. PI: Dianxiang Xu.
- “Software Agents on Information Networks”. National Hi-Tech Research & Development Plan of China (863). RMB Yuan 100,000. June 1996 – June 1998. PI: Dianxiang Xu.

AWARDS AND HONORS

- The second-class award for scientific and technological progress by the Education Ministry of China. 1998
- The third-class award for scientific and technological progress by the government of Jiangsu Province, China. 1996.
- The award for the remarkable achievements in science and technology invention and innovation by National Bureau in China, Technological Information Promotion System, United Nations. 1994
- The academic research award for outstanding young faculty by Nanjing University. 1996, 1997, 1998.

PROFESSIONAL ACTIVITIES AND SERVICES

Professional Societies

- Senior member, IEEE
- Member: IASTED Software Engineering Technical Committee (2004-2007)

Editorial Boards

- The Open Software Engineering Journal
- Journal of Information Assurance and Security

Referee

- IEEE TSE, IEEE TKDE, IEEE TSMC, IEEE TSC
- Journal of Systems and Software, Information and Software Technology, International Journal of Software Engineering and Knowledge Engineering, Transactions on Aspect-Oriented Software Development, Software Quality Journal, Software and Systems Modeling, Advances in Software Engineering, International Journal of Security and Networks, International Journal of Reliability and Safety, etc.

Conference/Workshop Program Committee

- 2010: SSIRI (Program Co-Chair), ACM SAC (SE Track)
- 2009: COMPSAC, ACM SAC (SE Track), QSIC, SSIRI, AST
- 2008: COMPSAC, ACM SAC (SE and ME Tracks), QSIC, SSIRI, AST, TASE, MSVVEIS, ICNSC
- 2007: COMPSAC, SMC, ACM SAC SE Track, QSIC, WTAOP (Co-Chair), AST, CONFENIS, MSVVEIS,
- 2006: WTAOP, MSVVEIS, ISEAT, TQACBS
- 2005: Asian Workshop on AOSD, SERP
- 2004: ICTAI