

## CATHY HONGHUI XIA

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Columbus, OH 43210  
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### EDUCATION

- 1993-1998 *Ph.D. in Engineering-Economic Systems and Operations Research*. Jan 1999  
Stanford University, Stanford, CA  
Dissertation: Optimal Control of Queueing Systems with Applications in  
Communication, Computing and Manufacturing Systems  
Advisor: Nicholas Bambos; Co-Advisor: Peter Glynn
- 1994-1996 *M.Sc. in Statistics*. June 1996  
Stanford University, Stanford, CA
- 1988-1992 *B.S. (with Honor) in Applied Mathematics*. July 1992  
Peking University, Beijing, China

### PROFESSIONAL EXPERIENCE

- 5/2022- present *Professor*. Integrated Systems Engineering, & (by courtesy)  
Computer Science and Engineering, The Ohio State University, Columbus, OH
- 2012-2022 *Associate Professor (with tenure)*. Integrated Systems Engineering, & (by courtesy)  
Computer Science and Engineering, The Ohio State University, Columbus, OH
- 2008-2012 *Associate Professor (tenure track)*. Integrated Systems Engineering, & (by courtesy)  
Computer Science and Engineering, The Ohio State University, Columbus, OH
- 2000-2008 *Research Scientist*. Department of Distributed Computing, IBM Thomas J. Watson  
Research Center, Yorktown Heights, NY
- 1998-2000 *Post Doc*. Department of System Analysis and Optimization, IBM Thomas J. Watson  
Research Center, Yorktown Heights, NY

### TEACHING EXPERIENCE

- 2008-Present *Instructor*. Department of Integrated Systems Engineering, The Ohio  
State University, Columbus, OH
- Graduate courses:
- Advanced Topics in Stochastic Modeling: Theory of Queues and Stochastic Networks
  - Simulation for System Analytics and Decision-Making
  - Performance Modeling and Simulation
  - Discrete-event System Simulation
  - Stochastic Processes in System Engineering (I & II)
- Undergraduate courses:
- Stochastic Modeling and Simulation
  - Simulation in Production Systems

## PROFESSIONAL ACTIVITIES

### Extramural Activities

#### **Editorial Board**

- 2017 – 2020 Associate Editor, IISE Transactions (formerly IIE Transactions)
- 2012 – present Associate Editor, Inter. J. of Inf. Sys. in the Service Sector (IJSSS)
- 2019 – present Editorial Board, Stochastic Models
- 2018 – present Editorial Board, PACM on Measurement and Analysis of Computing Systems (POMACS)
- 2011 – present Editorial Board, Performance Evaluation
- 2012 – 2015 Topical Editor, Wiley Encyclopedia of Operations Research and Management Science (EORMS)
- 2013 Guest Editor, Service Science

#### **Service to Professional Societies**

- 2022 – present INFORMS NSF Liaison Committee
- 2015 – 2019 Board of Directors, ACM Sigmetrics Society (Elected)
- 2015 – 2017 Board of Directors, ACM Sigmetrics Society (Elected)
- 2006 – 2008 *Chair*, Professional Interest Community on Performance Modeling & Analysis

#### **Conference and Meeting Organization**

- 2022 Chair, Rising Start Award Committee, ACM Sigmetrics Society
- 2020 Best Paper Award Committee, IFIP WG7.3 Performance 2020 Conference
- 2017 INFORMS George Nicholson Student Paper Competition Program Committee
- 2016 Rising Start Award Committee, ACM Sigmetrics Society
- 2015 Chair of Best Paper Award Committee, IFIP WG7.3 Performance 2015 Conference
- 2015 Cluster Chair, INFORMS Annual Meeting
- 2015 INFORMS George Nicholson Student Paper Competition Program Committee
- 2014 INFORMS George Nicholson Student Paper Competition Program Committee
- 2013 Workshop Chair, ACM SIGMETRICS Conference
- 2012 Cluster Chair, INFORMS Annual Meeting
- 2011 Program Co-chair, INFORMS Midwest Regional Meeting
- 2008 Tutorial Chair, ACM SIGMETRICS Conference
- 2006 Student Activity Chair, ACM Sigmetrics/Performance Conference, St. Malo, France
- *Technical Program Committee*: ACM SIGMETRICS 2004 – present, IFIP Performance Conference 2004-present, MAMA 2014 - present, etc.
- *Referee*: Operations Research, Queueing Systems, Production and Operations Management, Manufacturing & Service Operations Management, INFORMS Journal on Computing, Transportation Science, Performance Evaluation, Annals of Operations Research, European Journal of Operations Research, Probability in the Engineering and Information Sciences, IEEE Transactions on Service Computing, IEEE/ACM Transactions on Networking, IEEE Transactions on Automatic Control, IEEE Transactions on Parallel and Distributed Systems

## HONORS, AWARDS AND DISTINCTIONS

- Lumley Research Award, OSU College of Engineering, 2019
- Honorable Mention, The George Nicholson Student Paper Competition 2016
- Best Paper Runner-up Award, IEEE INFOCOM 2013
- IBM Shared University Research Award on Big Data, Analytics and Cloud, 2013
- OSU College of Engineering Instructional Technology Development Award, 2012
- Big Ten Women in Engineering Workshop Research Collaboration Travel Award 2010
- IBM Research Division Award, 2008
- IBM Research Division Award, 2007
- Fourth Invention Plateau Award, IBM T.J. Watson Research, 2007
- Third Invention Plateau Award, IBM T.J. Watson Research, 2006
- IBM Research Division Award, 2005
- Second Invention Plateau Award, IBM T.J. Watson Research, 2004
- Best Practice, IBM Academy of Technology, 2003
- First Invention Plateau Award, IBM T.J. Watson Research, 2003
- IBM Application Invention Achievement Award, 2001

## INVENTIONS AND PATENS

1. Method and apparatus for on-demand resource allocation and job management. Patent #: 8365173. Inventors: Wuqin Lin, Zhen Liu, Charalambos Stavropoulos, Cathy Honghui Xia. Issued January 29, 2013.
2. Adaptive resource allocation for multiple correlated sub-queries in streaming systems. Inventors: Parijat Dube, Ankit Jain, Zhen Liu, Cathy Honghui Xia. US Patent App. 12/884,390. Issued: March 22, 2012.
3. Market demand estimation method, system, and apparatus. . Inventors: Parijat Dube, Honghui Xia. US Patent #8,126,765. Issued 2012.
4. Distributed joint admission control and dynamic resource allocation in stream processing networks. Inventors: H. Feng, Z. Liu, H. Xia, L. Zhang. US Patent #7889651, issued February 15, 2011.
5. Method and apparatus for resource allocation for stream data processing. Inventors: A. Tang, Z. Liu, H. Xia and L. Zhang. US Patent #7,826,365, issued November 2, 2010.
6. Method and system for on-line performance modeling using inference for real production IT systems. Inventors: Z. Liu, H. Xia, F. Zhang, and L. Zhang. US Patent #7,739,099, issued June 15, 2010.
7. Apparatus and methods for classification of Web sites. Inventors: N. Halim, Z. Liu, M.S. Squillante, H. Xia, S. Yu, and L. Zhang. US Patent #7792951, issued Sept. 2010. TW Patent #I234081.
8. Methods and apparatus for cost minimization of multi-tiered infrastructure with end-to-end delay guarantees. Inventors: Wuqin Lin, Zhen Liu, Cathy Honghui Xia, Li Zhang. US Patent 7,626,917; KR Patent 925,137; TW Patent I353,135, issued 2009.
9. Method and apparatus for on-demand resource allocation and job management. US Patent #: 7526765. Inventors: Wuqin Lin, Zhen Liu, Charalambos Stavropoulos, Cathy Honghui Xia. Issued: April 28, 2009.
10. Method and apparatus for automatic system parameter configuration for performance improvement. Inventors: Z. Liu, M. Raghavachari, H. Xia, and L. Zhang. US Patent #7490234, issued Feb. 2009.
11. System and apparatus for optimally trading off the replication overhead and consistency level in distributed applications. Inventors: Z. Liu, H. Xia, H. Yang, and F. Ye. US Patent #8,037,023, issued March 2009.
12. Apparatus and methods for co-location and offloading of Web site traffic based on traffic pattern recognition. Inventors: D. M. Dias, R. P. King, Z. Liu, M. S. Squillante, S. Yu, and L. Zhang. US Patent #7386611, issued June 2008. . TW Patent #I243313.
13. Method and apparatus for automatic model building inference for IT systems. Inventors: Z. Liu, P.

- Momcilovic, and L. Zhang. US Patent #7296256, issued November 2007.
14. Method and apparatus for automatic system parameter configuration for performance improvement. Inventors: Z. Liu, M. Raghavachari, H. Xia, and L. Zhang. US Patent #7272707, issued September 2007.
  15. Clock synchronization for network measurements with clock resets. Inventors: Z. Liu, H. Xia, and L. Zhang. US Patent #7194649, issued March 2007.
  16. Clock synchronization with removal of clock skews through network measurements in derivation of a convex hull. Inventors: Z. Liu, H. Xia and L. Zhang. US Patent #6957357, issued October 2005.

## PUBLICATIONS

### Edited Books

1. Lu Y. and Xia C.H. (Eds) 2013. *Special Issues on Cloud Computing as a Service, Service Science*. INFORMS Journal.
2. Liu Z. and Xia C.H. (Eds), 2008. *Performance Modeling and Engineering*. New York: Springer ISBN 978-0-387-79360-3.

### Chapters in Edited Books

1. \*Tang A., Liu Z., Xia C.H., and Zhang L. 2006. Distributed Resource Allocation for Stream Data Processing Systems. In *High Performance Computing and Communications: Second International Conference (HPCC 2006)*. Edited by M. Gerndt, D. Kranzlmuller. Berlin Heidelberg: Springer-Verlag. pp. 91-100.
2. Liu Z., Momcilovic P.\*, Xia C.H., and Zhang L. (2004). AMBIENCE: Automatic Model Building using InferENCE. In Nidhal Rezg (Eds.), *Special Issue: Reactive Systems Modelling: A Selection of Papers Presented at the French-speaking Workshop MSR'03*, Taylor & Francis, London.
3. Xia C.H., Shanthikumar J.G.. 2003. Asymptotic Optimal Control of Multi-class G/G/1 Queues with Feedback. In *Stochastic Modeling and Optimization of Manufacturing Systems and Supply Chains*. Edited by David D. Yao, W.H. Zijm, W.H.M. Zijm, and J.G. Shanthikumar. Boston/Dordrecht/London: Kluwer Academic Publishers. pp. 127-139.
4. Zhang L., Liu Z., Riabov A., Schulman S., Xia C.H., and \*Zhang F. 2003. A Comprehensive Toolset for Workload Characterization, Performance Modeling and On-line Control. In *Computer Performance Evaluation: Modeling Techniques and Tools*. Vol. 13. Edited by P. Kemper; W.H. Sanders. Berlin; New York: Springer. pp. 63-77.
5. Liu Z., Squillante M.S., Xia C.H., Yu S.-Z., Zhang L., \*Malouch N.M., and Dantzig P. 2002. Analysis of Caching Mechanisms from Sporting Event Web Sites. In *Advances in Computing Science-ASIAN 2002: Internet Computing and Modeling, Grid Computing, Peer-to-peer Computing, and Cluster Computing*. Vol. 2550. Edited by A. Jean-Marie. Berlin; New York: Springer. pp. 76-86.

**Journal Papers** (\* identifies the student author)

1. \*Zeng Y., Tan J., and Xia C.H. (2021). "Fork and Join Queueing Networks with Heavy Tails: Scaling Dimension and Throughput Limit". *Journal of the ACM (JACM)*, 68 (3), 1-30.
2. \*Zeng Y., Chaintreau A., Towsley D., and Xia C.H. (2018). "Throughput Scalability Conditions for Fork-Join Networks with Scaling Sizes, Storage, and Processing Speed". *Operations Research*, 66(6):1728-1743. The preprint of this paper was recognized with **2016 George E. Nicholson Best Student Paper Honorable Mention Award**.
3. \*Zeng Y. and Xia C.H. (2017). "Optimal Bulking Threshold of Batch Service Queues", *Journal of Applied Probabilities*, 54(2), pp. 409-423.
4. \*Liu J., Shroff N.B., Xia C.H., and Sherali H.D. (2016). "Joint Congestion Control and Routing Optimization: An Efficient Second-Order Distributed Approach", in *IEEE/ACM Transactions on Networking*, 24(3), pp. 1404-1420.
5. \*Tan Y., and Xia C.H. (2015). "An Adaptive Learning Approach for Efficient Resource Provisioning in Cloud Services". *Performance Evaluation Review*, 42(4), pp. 3-11.
6. \*Liu J., Xia C.H., Shroff N.B., Zhang X. (2013). "On Distributed Computation Rate Optimization for Deploying Cloud Computing Programming Frameworks", *Performance Evaluation Review*, vol. 40, no. 4, pp. 63-72.
7. \*George D., Xia C.H., and Squillante M.S. (2012). "Exact-order asymptotic analysis for closed queueing networks". *Journal of Applied Probability*, 49(2): 1-18.
8. \*Tan Y., Lu Y. and Xia C.H. (2012). "Provisioning for Large Scale Loss Network Systems with Applications in Cloud Computing". *Performance Evaluation Review*, 40(3), pp. 83-85.
9. \*George D. and Xia C.H. (2011). "Fleet Sizing for a Vehicle Rental Service via Closed Queueing Network Analysis", *European Journal of Operations Research*, 211(1): 198-207.
10. \*Gera A. and Xia C.H. (2011). "Learning Curves and Stochastic Models for Pricing and Provisioning Cloud Computing Services", *Service Science*, 3(1): 99-109.
11. \*Feng H., Xia C.H., Liu Z. and Zhang L. (2011). "Linear-Speed Interior-Path Algorithms for Distributed Control of Information Networks", *Performance Evaluation*, 67: 1107-1122.
12. Xia C.H. and \*Chow A.L. (2010). "Asymptotically Optimal Load Distribution for Multipath Streaming under FEC", *Probability in the Engineering and Informational Sciences (PEIS)*, 24(4): 509-523.
13. \*H. Zhao, C.H. Xia, Z. Liu, and D. Towsley. (2010). "A Unified Modeling Framework for Distributed Resource Allocation of General Fork and Join Processing Networks". *Perform. Evaluation Review* 38(1): 299-310.
14. Liu Z., \*Tang A., Xia C.H., and Zhang L. (2009). "A Decentralized Control Mechanism for Stream Processing Networks", *Annals of Operations Research*, 170(1): 161-182.

15. Xia C.H. and \*Dube P. (2007). "Dynamic Pricing in e-Services under Demand Uncertainty", *Production and Operations Management*, 16(6): 701-712.
16. \*Dube P., Liu Z., Wynter L., and Xia C.H. (2007). "Competitive Equilibrium in e-Commerce: Pricing and Outsourcing", *Computers & Operations Research*, 34(12): 3541-3559.
17. \*Feng H., Liu Z., Xia C.H. and Zhang L. (2007). "Load Shedding and Distributed Resource Control of Stream Processing Networks", *Performance Evaluation*, 64(9-12): 1102-1120.
18. C.H. Xia, D. Towsley, Z. Liu and \*M. Lelarge. (2007). "Scalability of Fork/Join Queueing Networks with Blocking". *ACM Sigmetrics Performance Evaluation Review*. 35(1): 133-144.
19. Liu Z., Wynter L., Xia C.H. and \*Zhang F. (2006). "Parameter Inference of Queueing Models for IT Systems using End-to-End Measurements", *Performance Evaluation*, 63(1): 36-60.
20. \*Lin W., Liu Z., Xia C.H., and Zhang L. (2005). "Optimal Capacity Allocation for Web Systems with End-to-end Delay Guarantees", *Performance Evaluation*, 62(1-4): 400-416.
21. Xia C.H., Liu Z., Squillante M.S., Zhang L. and \*Malouch N.M. (2005). "Web Traffic Modeling at a Finer Time Scales and Performance Implication", Special Issue on Long Range Dependence and Heavy Tail Distributions, *Performance Evaluation*, 61(2-3): 181-201.
22. \*Chang J., Ayhan H., Dai J.G. and Xia C.H. (2004). "Dynamic scheduling of a Multiclass Fluid Model with Transient Overload", *Queueing Systems*, 48(3-4): 263-307.
23. Xia C.H., Liu Z., Squillante M.S., and Zhang L. (2004). "Lower Bounds for FBM/GI/1 Queues with Subexponential Service Times", *Probability in the Engineering and Informational Sciences (PEIS)*, 18(1): 87-101.
24. Peköz E., Richter R. and Xia C.H. (2003). "Characterizing Losses During Busy Periods in Finite Buffer Systems", *Journal of Applied Probability*, 40(1): 242-249.
25. Liu Z., Squillante M.S., Xia C.H., Yu S.-Z., and Zhang L. 2003. Profile-based Traffic Characterization of Commercial Web Sites. *Teletraffic Science and Engineering*. Vol.5, pp. 231-240.
26. Xia C.H., Liu Z., Squillante, M.S., Zhang, L. and \*Malouch, N. 2003. Analysis of Performance Impact of Drill-down Techniques for Web Traffic Models. *Teletraffic Science and Engineering*. Vol.5, pp. 409-418.
27. Zhang L., Liu Z., Riabov A., Schulman S., Xia C.H., and \*Zhang F. 2003. "Tools for Measuring, Benchmarking, and Online Control-A Comprehensive Toolset for Workload Characterization, Performance Modeling, and Online Control". *Lecture Notes in Computer Science*, vol. 2794, pp. 63-77.
28. Xia C.H., Michailidis G. and Bambos N., and Glynn P.W. (2002). "Optimal Control of Parallel Queues with Batch Service", *Probability in the Engineering and Informational Sciences (PEIS)*, 16(3): 289-307.
29. Squillante M.S., Xia C.H. and Zhang L. (2002). "Optimal scheduling in queueing network models of high-volume commercial web sites", *Performance Evaluation*, 47(4): 223-242.

30. Xia C.H., Michailidis G. and Bambos N. (2001). "Dynamic On-line Task Scheduling on Parallel Processors", *Performance Evaluation*, 46(2-3): 219-233.
31. Xia C.H., Shanthikumar J.G. and Glynn P.W. (2000). "On the Asymptotic Optimality of the SPT Rule for the Static Flow Shop Average Completion Time Problem", *Operations Research*, 48(4): 615-622.

#### **Abstracts and Short Entries (Peer Reviewed)**

1. \*Zeng Y., Tan J. and Xia C.H. (2018). Fork and Join Queueing Networks with Heavy Tails: Scaling Dimension and Throughput Limit. *Performance Evaluation Review*, 46(1), pp. 122-124. [*Peer Reviewed*]
2. \*George D. and Xia C.H. (2010). Asymptotic Analysis of Closed Queueing Networks and Its Implications to Achievable Service Levels. *Performance Evaluation Review*, 38(2):3-5. [*Peer Reviewed*]
3. \*Lin W., Z. Liu, C. H. Xia, and L. Zhang. (2004). Cost minimization of multi-tiered e-business infrastructure with end-to-end delay guarantees. *Perform. Evaluation Review* 32(2): 25-27. [*Peer Reviewed*]
4. \*Lin W., Liu Z., Stavropoulos H. and Xia C.H. (2003). Hard Deadline Queueing System with Application to Unified Messaging Service. *Perform. Evaluation Review*, 31(2):31-33. [*Peer Reviewed*]
5. Xia C.H., Liu Z., Squillante M.S., Zhang L., Malouch N. (2002). Traffic Modeling and Performance Analysis of Commercial Web Sites. *Performance Evaluation Review*, 30(3):32-34. [*Peer Reviewed*]
6. Squillante M.S., Xia C.H. and Zhang L. (2001). Optimal Scheduling in Queueing Network Models of High-Volume Commercial Web Sites. *Performance Evaluation Review*, 29(3):47-48. [*Peer Reviewed*]

#### **Refereed Conference Proceedings**

1. C.H. Xia, P. Natarajan, and N. Chen. (2021). Teaching Performance Modeling via Software and Instructional Technology. In *Proc. of TePACS -1st International Workshop on Teaching Performance Analysis of Computer Systems*. November 2021.
2. \*K. Jin, C. Liu, and C.H. Xia. (2021). Two-sided Wasserstein Procrustes Analysis. In *30th International Joint Conference on Artificial Intelligence (IJCAI-21)*, August 2021. (Acceptance ratio: 13.9% out of 4204 submissions).
3. \*P. R. Natarajan, A. Carrel and C.H. Xia. An equilibrium approach toward the optimal fleet management of a Last Mile Transit Service. In *TRB (Transportation Research Board) 2021 Annual Meeting*, Jan 2021. [*Peer Reviewed*]
4. \*S. M. Mavrouli, A. Carrel, P.R. Natarajan, A. Broaddus, R. Twumasi-Boakye, and C.H.Xia, Behavioral Factors Affecting Adoption of Microtransit by Commuters. In *TRB (Transportation Research Board) 2021 Annual Meeting*, Jan 2021. [*Peer Reviewed*]
5. \*K. Jin, and C.H. Xia. (2021). Data-Driven Design of Microtransit Services via Optimal Transport and

- Simulated Annealing. (Poster). In *Proceedings of The 22nd International Workshop on Mobile Computing Systems and Applications (HotMobile '21)*. [Peer Reviewed]
6. \*Y. Tian, J. Liu and C. H. Xia. MATE: A Memory-Augmented Time-Expansion Approach for Optimal Trip-Vehicle Matching and Routing in Ride-Sharing. In *e-Energy 2020 - Proceedings of the 11th ACM International Conference on Future Energy Systems*, 2020, pp. 133–143. [Peer Reviewed]
  7. \*K. Jin, C. Liu, and C.H. Xia. (2020). OTDA: a Unsupervised Optimal Transport framework with Discriminant Analysis for Keystroke Inference. In *Proceedings of the 2020 IEEE Conference on Communications and Network Security (IEEE CNS'20)*. [Peer Reviewed]
  8. \*Y. Zeng, J. Tan and C.H. Xia. (2018). Fork and Join Queueing Networks with Heavy Tails: Scaling Dimension and Throughput Limit, in *Proceedings of the ACM SIGMETRICS 2018*, Irvine, CA. [Peer Reviewed]
  9. \*Y. Zeng, A. Chaintreau, D. Towsley and C.H. Xia. (2016). A Necessary and Sufficient Condition for Throughput Scalability of Fork and Join Networks with Blocking. In *Proceedings of the SIGMETRICS/Performance Joint International Conference on Measurement and Modeling of Computer Science*, 2016, pp. 25–36. [Peer Reviewed]
  10. \*Y. Tan and C.H. Xia (2016). Cyber Maintenance Policy Optimization via Adaptive Learning, in *Proceedings of IEEE INFOCOM*, July 2016. [Peer Reviewed]
  11. \*J. Liu, C.H. Xia, N.B. Shroff, and H.D. Sherali. (2014). Distributed optimal load shedding for disaster recovery in smart electric power grids: a second-order approach. In: *Proceedings of ACM Sigmetrics 2014 - The 2014 International Conference on Measurement and modeling of computer systems* [Peer Reviewed]
  12. \*J. Liu, C.H. Xia, N.B. Shroff, and H.D. Sherali. (2013). Distributed Cross-Layer Optimization in Wireless Networks: A Second-Order Approach, in *Proc. IEEE INFOCOM*, Turin, Italy, Apr. 14-19, 2013 (**Best Paper Runner-up Award**). [Peer Reviewed]
  13. \*Tan Y., Lu Y. and Xia C.H. (2012). “Provisioning for large scale cloud computing services”. *Proceedings of 12<sup>th</sup> ACM Sigmetrics/Performance Joint International Conference on Measurement and Modeling of Computer Systems*, pp. 407-408. [Peer Reviewed]
  14. \*Y. Huai, R. Lee, S. Zhang, C.H. Xia, and X. Zhang. (2011). DOT: A Matrix Model for Analyzing, Optimizing and Deploying Big Data Analytics in Distributed Systems. In: *Proceedings of ACM Symposium on Cloud Computing*. [Peer Reviewed]
  15. \*H. (Chuck) Zhao, C.H. Xia, Z. Liu, and D. Towsley. (2010). A Unified Modeling Framework for Distributed Resource Allocation of General Fork and Join Processing Networks. In: *Proceedings of ACM Sigmetrics 2010*, New York, NY. [Peer Reviewed]
  16. \*H. (Chuck) Zhao, C. H. Xia, Z. Liu, and D. Towsley. (2010). Distributed Resource Allocation for Synchronous Fork and Join Processing Networks. In: *Proceedings of IEEE INFOCOM Mini-*



conference 2010, San Diego, CA. [Peer Reviewed]

17. \*A. L.H. Chow, H. Yang, Cathy H. Xia, Minkyong Kim, Zhen Liu, Hui Lei. (2009). EMS: Encoded Multipath Streaming for Real-time Live Streaming Applications. In: *Proceedings of the 17th IEEE International Conference on Network Protocols (ICNP'09)*, Princeton, NJ. [Peer Reviewed]
18. \*Y. Lei, Z. Liu, D. Towsley and C.H. Xia. (2008). Distributed Operator Placement and Data Caching for In-Network Stream Query Processing. In: *Proceedings of IEEE INFOCOM 2008*, Phoenix, AZ. [Peer Reviewed]
19. \*B. Rong, Fred Douglass, Zhen Liu, and Cathy H. Xia. (2007). Failure Recovery in Cooperative Data Stream Analysis. In: *Proceedings of the 2nd International Conference on Availability, Reliability and Security (ARES07)*. [Peer Reviewed]
20. \*J. Liu, Zhen Liu, Don Towsley and Cathy H. Xia. (2007). Maximize the Data Utility of a Data Archiving & Querying System through Joint Coding and Scheduling. In: *Proceedings of the 6th International Conference on Information Processing in Sensor Networks (IPSN07)*, Cambridge, MA. [Peer Reviewed]
21. C.H. Xia, D. Towsley, and \*C. Zhang. (2007). Distributed Resource Management and Admission Control of Stream Processing Systems with Max Utility. In: *Proceedings of the 27th International Conference on Distributed Computing Systems (ICDCS)*, Toronto, Canada. [Peer Reviewed]
22. C.H. Xia, D. Towsley, Z. Liu and \*M. Lelarge. (2007). Scalability of Fork/Join Queueing Networks with Blocking. In: *Proceedings of ACM SIGMETRICS 2007*, San Diego, CA. [Peer Reviewed]
23. C.H. Xia, \*J. Broberg, Z. Liu and L. Zhang. (2006). Distributed Resource Allocation in Stream Processing Systems. In: *Proceedings of the 20th International Symposium on Distributed Computing (DISC 2006)*. [Peer Reviewed]
24. Broberg J., Liu Z., Xia C.H. and Zhang L., "A Multicommodity Flow Model for Distributed Stream Processing", *Proceedings of SIGMETRICS/Performance 2006*, pp. 377-378. [Peer Reviewed]
25. \*A. Tang, Z. Liu, C.H. Xia, and L. Zhang (2006). Distributed Resource Allocation for Stream Data Processing. Second International Conference on High Performance Computing and Communications (HPCC 2006), Munich, Germany, September 13-15, 2006, pp. 91-100. [Peer Reviewed]
26. \*A. Kashyap, C. H. Xia, Z. Liu and P. Dube. (2005). Scaling Laws of Sampling and Capacity of Sensors on Closed Surfaces. In: *Proceedings of the 2005 International Conference on Wireless Networks (ICWN05)*. [Peer Reviewed]
27. \*A. Kayshyap, L. Lastras, C. H. Xia and Z. Liu. (2005). Distributed Source Coding in Dense Sensor Networks. In: *Proceedings of Data Compression Conference (DCC'05)*. [Peer Reviewed]
28. \*B. Xi, Z. Liu, M. Raghavachari, C.H. Xia and Li Zhang. (2004). A Smart Hill-Climbing Algorithm for Application Server Configuration. In: *Proceedings of the 13th International Conference on World Wide Web (WWW2004)*. [Peer Reviewed]

29. \*M. Lelarge, Z. Liu and C.H. Xia. (2004). Asymptotic Tail Distribution of End-to-End Delay in Networks of Queues with Self-Similar Cross Traffic. In: *Proceedings of INFOCOM 2004*. [Peer Reviewed]
30. Wynter L., Xia C.H. and Zhang F., "Parameter Inference of Queueing Models for IT Systems using End-to-End Measurements", *Proceedings of SIGMETRICS/Performance 2004*. [Peer Reviewed]
31. \*J. Chang, H. Ayhan, J. Dai, M.S. Squillante and C.H. Xia. (2003). Optimal Dynamic Scheduling in a Multiclass Fluid Model of Internet Servers with Transient Over-load. In: *Proceedings of the 42nd IEEE Conference on Decision and Control (CDC 2003)*. [Peer Reviewed]
32. \*P. Dube, Z. Liu, L. Wynter and Cathy H. Xia. (2003). Outsourcing and Price-QoS Equilibrium for Ecommerce and Internet Firms: IT On-Demand. In: *Proceedings of the 42nd IEEE Conference on Decision and Control (CDC 2003)*. [Peer Reviewed]
33. C.H. Xia and Z. Liu. (2003). Queueing Systems with Long-Range Dependent Input Process and Subexponential Service Times. In: *Proceedings of ACM SIGMETRICS 2003*, San Diego, CA. [Peer Reviewed]
34. Z. Liu, L. Wynter, and C.H. Xia. (2003). Usage-based versus Flat Pricing for e-business Services with Differentiated QoS. In: *Proceedings of the IEEE Conference on Electronic Commerce (CEC 2003)*. [Peer Reviewed]
35. Z. Liu, L. Wynter, and C.H. Xia (2003). Pricing and QoS of information services in a competitive market (Extended Abstract). In *Proceedings of 4th ACM Conference on Electronic Commerce (EC-2003)*, San Diego, California, USA, June 9-12, 2003. (EC 2003). pp. 188-189. [Peer Reviewed]
36. Li Zhang, Cathy H. Xia, Mark S. Squillante and Nat Mills. (2002). Workload Service Requirements Analysis: A Queueing Network Optimization Approach. In: *Proceedings of the 10th IEEE International Symposium on Modeling, Analysis, and Simulation of Computer and Telecommunication Systems (MASCOTS2002)*. [Peer Reviewed]
37. Li Zhang, Zhen Liu and Cathy H. Xia. (2002). Clock Synchronization Algorithms for Network Measurements. In: *Proceedings of IEEE INFOCOM 2002*. [Peer Reviewed]
38. Liu Z., Squillante M.S., Cathy H. Xia, Yu S.-Z., Zhang L., Dantzig P.M. and \*Malouch N.M. (2002). Analysis of Measurement Data from Sporting Event Web Sites. In: *Proceedings of IEEE Globecom 2002*. [Peer Reviewed]
39. Liu Z., Squillante M.S., Xia C.H., Yu S.-Z. and Zhang L. (2002). Traffic Profiling, Clustering and Classification for Commercial Web Sites. In: *Proceedings of the 10th International Conference on Telecommunication Systems Management (ICTSM10)*. [Peer Reviewed]
40. Shun-zheng Yu, Zhen Liu, Mark S. Squillante, Cathy H. Xia and Li Zhang. (2002). A Hidden Semi-Markov Model for Web Workload Self-similarity. In: *Proceedings of 21st IEEE International Performance, Computing, and Communications Conference (IPCCC 2002)*. [Peer Reviewed]

41. M.S. Squillante, Cathy H. Xia, D.D. Yao and L. Zhang. 2001. Threshold-Based Priority Policies for Parallel-Server Systems with Affinity Scheduling. In: Proceedings of the American Control Conference (ACC2001). : 2292-2299. [Peer Reviewed]
42. Squillante M.S., Xia C.H. and Zhang L. (2001). Optimal Scheduling in Queueing Network Models of High-Volume Web Sites. In: *Select Proceedings of the SPIE-2000 Conference on Internet Quality and Performance and Control of Network Systems*. Vol. 4211: 113-121. [Peer Reviewed]

#### **Bulletins, Tech Reports, Fact Sheets & Archived Preprints**

1. Tan, Y., Lu, Y., Xia, C.H. (2018) Relative error of scaled poisson approximation via stein's method, 2018, Repository : arXiv
2. Lu Y. and Xia C.H. (2013). Special Section Introduction: Cloud Computing as a Service, *Service Science*. 5(2): 86-87.
3. Liu Z., Wynter L. and Xia C.H. (2002). "Pricing Information Services in a Competitive Market: Avoiding Price Wars", METALAU - Methods, algorithms and software in automatic control. INRIA Research Report. [Peer Reviewed]

#### **Papers under Review**

1. Y. Tan and C.H. Xia. "Gradient-based Bayesian Adaptive Learning towards Optimal Cyber Maintenance Schedule", submitted to IISE Transactions, on 3/1/2021.
2. Y. Tian, J. Liu and C.H. Xia. "MATE: A Memory-Augmented Time-Expansion Approach for Optimal Trip-Vehicle Matching and Routing in Ride-Sharing", submitted to IEEE/ACM Transactions on Networking, on 3/1/2021.
3. Y.Lu, Y. Tan and C.H. Xia. "Relative Error of Poisson Approximation via Stein-Chen Method", in preparation, plan to submit to Journal of Applied Probability, on 3/15/2021.

#### **RECENT PRESENTATIONS**

##### **Invited (Selected) (2012-2021)**

1. C.H. Xia. Invited Seminar. "Asymptotic Performance of Large-scale Parallel and Distributed Processing Systems with Advancing Resource Capabilities". DoN workshop at University of Massachusetts, Amherst, Nov. 2019.
2. C.H. Xia (2018). Invited Talk. Asymptotic Performance of Large-scale Parallel and Distributed Processing Systems with Advancing Resource Capabilities. INFORMS International Meeting, Taipei, Taiwan.
3. Lu Y., Tan Y. and Xia, C.H. (2018). Moderate Deviations in Weighted Poisson Sum. INFORMS International Meeting, Taipei, Taiwan.

4. Zeng Y. and C.H. Xia (2017). Throughput Scalability of Large Parallel and Distributed Processing Systems with Advancing Capabilities. INFORMS Annual Meeting, Houston, TX.
5. C.H. Xia. **Keynote**, "Data-driven Optimization Approaches for Cyber Vulnerability Maintenance". The 11th ACM International Workshop on IOT and Cloud Computing, China, May 2016.
6. C.H. Xia. Invited seminar, "A Necessary and Sufficient Condition for Throughput Scalability of Fork and Join Networks with Blocking," Invited Presentation, **Nicholson Student Paper Prize I**, INFORMS 2016 Annual Meeting, Nov 2016, Nashville, TN. **Honorable Mention Award in the INFORMS George Nicholson Best Student Paper Competition.**
7. C.H. Xia. **Keynote**, "Planning for a Greener World through Cyber Intelligence & Optimization". The 10th ACM International Workshop on IOT and Cloud Computing, China, Dec. 2015.
8. C.H. Xia. Invited Seminar, "Fork-Join Queues and Distributed Methods", IBM T.J. Watson Research Center, Yorktown Heights, NY, Oct. 30, 2015.
9. C.H. Xia. Invited Seminar. "Managing Extreme-Scale Vehicle Sharing Systems via Stochastic Models and Distributed Methods", Tsinghua IoT Research Lab, WuXi, China, Oct. 2014.
10. C. Xia. "Managing Extreme-Scale Information Processing via Performance Modeling, Analysis and Distributed Methods", Shanghai Research Lab, IBM Research-China, Sept. 2014
11. C. Xia. Panel Discussion: "Cloud Infrastructure Challenges and Opportunities". Invited Panelist. INFORMS Annual Meeting, San Francisco, Nov. 2014.
12. C.H. Xia. "Throughput Scalability of Fork-join Queueing Networks with Blocking", INFORMS Annual Meeting, Philadelphia, PA, Nov. 1-4, 2015.
13. C.H. Xia. Invited Seminar, "Managing Extreme-Scale Computing via Stochastic Modeling and Distributed Methods", Microsoft Research Asia, Beijing, China, Sept. 2014.
14. D. George and C.H. Xia. Invited Talk. "Decentralized Inventory Rebalancing for Large-scale Vehicle Sharing Systems", INFORMS Annual Meeting 2013, Minneapolis, MN, Oct. 6-9, 2013.
15. Y.Tan, and C.H. Xia. Invited talk. "A Nonparametric Learning Approach to the Pricing and Provisioning Problem in Cloud Services", INFORMS Applied Probability Society Conference 2013 - Costa Rica.
16. J. Liu, C.H. Xia, N. Shroff (2013). "Toward Optimal, Efficient and Distributed System Design for the Smart Electric Power Grid". The Ohio State University – Battelle Memorial Institute Smart Grid Collaboration Workshop. Ohio State University, May 2013.

17. Xia C.H. Invited Talk. "DOT: a matrix model for analyzing, optimizing and deploying software for big data analytics in distributed systems". Joint Workshop between Battelle and Ohio State on Big Data and Cyber-security, Dec. 5, 2012.
18. Xia C.H. "Decentralized Control Policies for Large-Scale Vehicle Sharing Systems", INFORMS Annual Meeting 2012- Phoenix, AZ, October 14-17, 2012.
19. Y. Tan, Y. Lu and C.H. Xia. Invited Talk. "Provisioning for Cloud Computing with Quality of Service Constraint". IBM Workshop for Frontiers of Cloud Computing 2012. Hawthorn, NY, July 30-31, 2012.
20. Xia C.H. Invited Seminar, "Fleet Management of Large-Scale Vehicle Sharing Systems via Stochastic Models and Distributed Methods", Department of Industrial Engineering and Management, Peking University, June 2012.
21. Xia C.H. "Exact Order Asymptotic Analysis of Closed Queueing Networks", INFORMS International - Beijing, June 24-27, 2012.

#### **Contributed (Selected) (2012-2021)**

1. P. R. Natarajan, A. Carrel and C.H. Xia. An equilibrium approach toward the optimal fleet management of a Last Mile Transit Service. In TRB (Transportation Research Board) 2021 Annual Meeting, Jan 2021. [Peer Reviewed]
2. S. M. Mavrouli, A. Carrel, P.R. Natarajan, A. Broaddus, R. Twumasi-Boakye, and C.H.Xia, Behavioral Factors Affecting Adoption of Microtransit by Commuters. In TRB (Transportation Research Board) 2021 Annual Meeting, Jan 2021. [Peer Reviewed]
3. Jin, K. and Xia, C.H. (2021). "Toward the Design of Microtransit Services via Optimal Transport and Simulated Annealing". Urban Assemblance: the City as Architecture, Media, AI and Big Data, 2021.
4. Y. Tian, J. Liu and C. H. Xia. MATE: A Memory-Augmented Time-Expansion Approach for Optimal Trip-Vehicle Matching and Routing in Ride-Sharing. In Proc. ACM e-Energy, Melbourne, Australia, Jun. 2020
5. K. Jin and C.H. Xia. "OTDA: an Optimal Transport framework with Discriminant Analysis for Keystroke Inference", IMACCS Workshop, June 2019.
6. K. Jin and C.H. Xia. "Toward the Design of Microtransit Services via Optimal Transport and Simulated Annealing", ISE Research Day, OSU, Dec. 2019.
7. T. Hu, T. Allen and C.H. Xia. "Planning in Decentralized Partially Observed Markov Decision Process", ISE Research Day, OSU, Dec. 2019.

8. Y. Zeng, J. Tan, and C.H. Xia, "Fork and Join Queueing Networks with Heavy Tails: Scaling Dimension and Throughput Limit", ACM Sigmetrics, 2018, Irvine, CA. [Peer-reviewed].
9. K. Jin and C.H. Xia. "Poem Generation via Markov Models", ISE Research Day, OSU, 2018.
10. Chris Brown, Shashank Tyagi and Cathy H. Xia. "Hidden Markov Models and Natural Language Processing", ISE Research Day, OSU, 2018.
11. \*Y. Zeng and C.H. Xia. "Throughput Scalability of Large Parallel and Distributed Processing Systems with Advancing Capabilities". INFORMS Annual Meeting, Houston, TX, Oct. 2017.
12. C.H. Xia. "A Necessary and Sufficient Condition for Throughput Scalability of Fork and Join Networks with Blocking," ACM SIGMETRICS / IFIP Performance 2016, Jun 2016, Antibes Juan-les-Pins, France. [Peer Reviewed]
13. C.H. Xia. "Cyber Maintenance Policy Optimization via Adaptive Learning", IEEE INFOCOM, San Francisco, CA, April 2016. [Peer Reviewed]
14. Y. Tan, and C.H. Xia. "Data-driven Decision Making via Adaptive Control for Cyber Password Management", INFORMS Annual Meeting, Philadelphia, PA, Nov. 1-4, 2015.
15. Y. Tan and C. Xia. "Resource Provisioning for Cloud Computing Services via Poisson Approximation", INFORMS Annual Meeting, San Francisco, Nov. 2014.
16. C. Xia and D. George. "Dynamic Inventory Rebalancing of Vehicle Sharing Systems under Nonstationary Demand", INFORMS Annual Meeting, San Francisco, Nov. 2014.
17. Y. Zeng and C. Xia. "Analysis of Optimal Threshold in Batch Service Queueing Systems", INFORMS Annual Meeting, San Francisco, Nov. 2014.
18. Jia Liu\*, Cathy H. Xia, Ness B. Shroff, and H. D. Sherali, "A Second-Order Approach for Distributed Load Shedding in Power Systems Post-Disaster Recovery," ACM Sigmetrics, Austin, TX, Jun. 2014. [Peer-reviewed].
19. Jia Liu\*, Cathy H. Xia, Ness B. Shroff, and H. D. Sherali, "Distributed Cross-Layer Optimization in Wireless Networks: A Second-Order Approach," in Proc. IEEE INFOCOM, Turin, Italy, Apr. 14-19, 2013. **Best paper runner-up Award.** [Peer-reviewed].
20. C. Xia and Y. Tan, "Provisioning for Cloud Computing Services via Non-parametric Adaptive Learning", INFORMS Annual Meeting 2013, Minneapolis, MN, Oct. 6-9, 2013.
21. Kimiebi Akah, Yue Tan, and C.H. Xia. "Optimal Capacity Planning for RHN Health Network via Queueing Models and Simulation", INFORMS Annual Meeting 2013, Minneapolis, MN, Oct. 6-9, 2013.

22. Y. Tan, Y. Lu and C.H. Xia. "Capacity Planning for a Class of Large-scale Loss Networks", INFORMS Annual Meeting 2013, Minneapolis, MN, Oct. 6-9, 2013.
23. Xia C.H. "Distributed Resource Allocation in Large Scale Data Intensive Computing", INFORMS Annual Meeting 2012- Phoenix, AZ, October 14-17, 2012.
24. Xia C.H. "Provisioning for Large Scale Loss Network Systems with Application in Cloud Computing", INFORMS Annual Meeting 2012- Phoenix, AZ, October 14-17, 2012.
25. Xia C.H. "Provisioning for Large Scale Cloud Services via Stochastic Models", INFORMS International - Beijing, June 24-27, 2012.
26. \*Y. Tan, Y. Lu and C.H. Xia. "Provisioning for critically-loaded loss networks". ACM SIGMETRICS International Conference on Measurement and Modeling of Computer Systems, London, United Kingdom, June 2012. [Peer-reviewed].
27. \*Y. Tan, Y.Lu and C.H. Xia. "Provisioning for Large Scale Loss Network Systems with Applications in Cloud Computing". MAMA Workshop 2012. London, UK, June 15, 2012. [Peer-reviewed].