D. J. (DONGJUN) WU

Ernest Scheller Jr. Chair in Innovation, Entrepreneurship and Commercialization Area Coordinator and Professor, Information Technology Management Department Editor, Management Science (Information Systems) Scheller College of Business Georgia Institute of Technology dj.wu@scheller.gatech.edu

EARNED DEGREES

University of Pennsylvania, Wharton School, Philadelphia, PA.

Ph.D. Managerial Sciences and Applied Economics, 5/1997

M.A. Decision Sciences, 12/1994.

Tsinghua University, Department of Computer Science and Technology, Beijing, P. R. China.

B.E. Industrial Engineering (Dual Degree), 7/1989

B.E. Computer Science (Major Degree), 7/1989.

EMPLOYMENT

Georgia Institute of Technology (GT), Scheller College of Business (SCOB), Atlanta, GA.

Ernest Scheller Jr. Chair in Innovation, Entrepreneurship and Commercialization, 5/2018 – present *Brady Family Professorship in Management,* 5/2017 – 5/2018

Area Coordinator, Information Technology Management (ITM), 5/2014 – present

Professor, ITM, 3/2014 – present

Thomas R. Williams Wachovia Term Professor in ITM, 8/2007 – 6/2011

Associate Professor, ITM (with tenure since 7/2005), 8/2003 – 3/2014.

University of Pennsylvania, Wharton School, Philadelphia, PA.

Visiting Associate Professor, Executive Master of Technology Management Program, 12/2002 – 2/2003.

Drexel University, LeBow College of Business, Philadelphia, PA.

Associate Professor, Management Information Systems (with tenure since 9/2002), 9/2001 – 7/2003 Assistant Professor, Management Information Systems, 9/1996 – 9/2001.

University of Pennsylvania, Wharton School, Philadelphia, PA.

Head Teaching Assistant, 9/1995 – 8/1996 Instructor, 1/1995 – 5/1995.

EDITORSHIP (Partial List)

Department Editor (IS), Management Science, 7/2020 – present.

Co-Editor, Management Science, Special Issue on The Human-Algorithm Connection, 2022.

Senior Editor, *Information Systems Research*, 2018 – 2020.

Associate Editor, *Management Science*, Information Systems, 2007 – 2020.

Associate Editor, Manufacturing and Service Operations Management (M&SOM), 2010 – 2014.

Senior Editor, Production and Operations Management, Management of Technology, 2007 - 2017.

HONORS AND AWARDS – TEACHING

- 1. Provost Teaching and Learning Fellow Associate, GT Center for Teaching and Learning, 2020 2021.
- 2. Provost Teaching and Learning Fellow, GT Center for Teaching and Learning, 2018 2020.
- 3. Georgia Tech *Thank a Teacher* Program Award (two notes) (for Teaching MGT 6056), 2021.
- 4. Georgia Tech *Thank a Teacher* Program Award (for Teaching MGT 4056), 2021.
- 5. Georgia Tech *Thank a Teacher* Certificate (for Teaching MGT 4056), 2020.
- 6. Georgia Tech *Thank a Teacher* Certificate (for Teaching MGT 6056), 2018.
- 7. Georgia Tech *Thank a Teacher* Certificate (for Teaching MGT 4056), 2018.
- 8. Hesburgh Award Teaching Fellow, GT Center for Teaching and Learning, 2017 2018.
- 9. Class of 1940 Course Survey Teaching Effectiveness Award, GT Center for Teaching and Learning, 2016.
- 10. Dean's Award for Teaching Excellence, SCOB, GT, 2014.
- 11. Runner-up Winner for *Professor of the Year*, GT Global EMBA Program, 2011.
- 12. Georgia Tech *Thank a Teacher* Certificate, 2011.
- 13. Georgia Tech *Thank a Teacher* Certificate (two notes) (for Teaching MGT 4057), 2009.

HONORS AND AWARDS – RESEARCH

- 14. Ernest Scheller Jr. Chair in Innovation, Entrepreneurship and Commercialization 5/2018 present.
- 15. Brady Family Professorship in Management, SCOB, GT, 5/2017 5/2018.
- 16. The Linda and Lloyd L. Byars Award for Faculty Research Excellence, SCOB, GT, 2017.
- 17. The Linda and Lloyd L. Byars Award for Faculty Research Excellence, SCOB, GT, 2013.
- 18. Thomas R. Williams Wachovia Term Professorship in ITM, SCOB, GT, 2007 2011.
- 19. Runner-Up Best Paper Award for "When Do ISVs Join a Platform Ecosystem? Evidence from the Enterprise Software Industry," *International Conference on Information Systems*, 2009 (with P. Huang, M. Ceccagnoli, and C. Forman).
- 20. Best Paper on Web-based Information Systems and Applications for "E-Sourcing: Impact of Bidding Behavior and Non-Price Attributes," *International Conference on Information Systems*, 2006 (with F. Zhong).

- 21. Best Paper on Valuing IT Opportunities for "Which Came First, IT or Productivity? The 'Virtuous Cycle' of Investment and Use in Enterprise Systems," *International Conference on Information Systems*, 2006 (with S. Aral and E. Brynjolfsson).
- 22. Best Paper on Economics and Regulation for "Optimal Electric Power Capacity Expansion in the Presence of Capacity Options," *Hawaii International Conference on System Sciences*, 2002 (with P. Kleindorfer and Y. Sun).

HONORS AND AWARDS – SERVICE

- 23. President (Elected), INFORMS Information Systems Society, 11/2019 11/2021.
- 24. Senior Editor Service Award, *Information Systems Research*. "Presented 2020 in appreciation for your valued service to the Institute for Operations Research and the Management Sciences," by Cole Smith, Vice President-Publications and Alok Gupta, Editor-in-chief, *ISR*, 2020.
- 25. Management Science Associate Editor Meritorious Service Award, 2019.
- 26. Manufacturing and Service Operations Management (M&SOM) Associate Editor Meritorious Service Award, 2014.
- 27. Management Science Associate Editor Meritorious Service Award, 2014.
- 28. Management Science Associate Editor Meritorious Service Award, 2013.
- 29. Management Science Associate Editor Meritorious Service Award, 2010.
- 30. Management Science Editor-in-Chief Certification of Appreciation, 2008, "for your service on the editorial board of Management Science, in deep appreciation of your outstanding contributions to Management Science."
- 31. Best Reviewer Award, INFORMS Conference on Information Systems and Technology, 2006.

PEER REVIEWED JOURNAL PUBLICATIONS

- 1. Huang, P., M. Ceccagnoli, C. Forman, and D.J. Wu, "IT Knowledge Spillovers, Absorptive Capacity, and Productivity: Evidence from Enterprise Software," forthcoming in, *Information Systems Research*. Accepted on October 22, 2021.
- 2. Dou, Y. and D.J. Wu, "Research Note Platform Competition under Network Effects: Piggybacking and Optimal Subsidization," *Information Systems Research*, Vol. 32, No. 3, pp. 820-835, September 2021.
- 3. Gao, Q., M. Lin, and D.J. Wu, "Education Crowdfunding on Student Performance: An Empirical Study," *Information Systems Research*, Vol. 32, No. 1, pp. 53-71, March 2021.
- 4. Retana, G., C. Forman, S. Narasimhan, M. Niculescu, and D.J. Wu, "Technology Support and Post-Adoption IT Service Use: Evidence from the Cloud," *MIS Quarterly*, Vol. 42, No. 3, pp. 961-978, September 2018.
- 5. Niculescu, M., D.J. Wu and L.Z. Xu, "Strategic Intellectual Property Sharing: Competition on an Open Technology Platform under Network Effects," *Information Systems Research*, Vol. 29, No. 2, pp. 498-519, June 2018.

- 6. Dou, Y., Y. Hu, and D.J. Wu, "Selling or Leasing? Pricing Information Goods with Depreciation of Consumer Valuation," *Information Systems Research*, Vol. 28, No. 3, pp. 585-602, September 2017.
- 7. Retana, G., C. Forman, and D.J. Wu, "Proactive Customer Education, Customer Retention, and Demand for Technology Support: Evidence from a Field Experiment," *Manufacturing and Service Operations Management* (M&SOM), Vol. 18, No. 1, pp. 34-50, Winter 2016.
- 8. Tunca, T., D.J. Wu, and F. Zhong, "An Empirical Analysis of Price, Quality, and Incumbency in Procurement Auctions," *Manufacturing and Service Operations Management* (M&SOM), Vol. 16, No. 3, pp. 346-364, Summer 2014.
- 9. Niculescu, M. and D.J. Wu, "Economics of Free Under Perpetual Licensing: Implications for the Software Industry," *Information Systems Research*, Vol. 25, No.1, pp. 173-199, March 2014.
- 10. Wu, D.J., M. Ding, and L. Hitt, "IT Implementation Contract Design: Analytical and Experimental Investigation of IT Payoff, Learning and Contract Structure," *Information Systems Research*, Vol. 24, No. 3, pp. 787-801, September 2013.
- 11. Dou, Y., M. Niculescu, and D.J. Wu, "Engineering Optimal Network Effects via Social Media Features and Seeding in Markets for Digital Goods and Services," *Information Systems Research*, Vol. 24, No. 1, pp. 164-185, March 2013.
- 12. Huang, P., M. Ceccagnoli, C. Forman, and D.J. Wu, "Appropriability Mechanisms and the Platform Partnership Decision: Evidence from Enterprise Software," *Management Science*, Vol. 59, No. 1, pp. 102-121, January 2013.
- 13. Ceccagnoli, M., C. Forman, P. Huang, and D.J. Wu, "Co-creation of Value in a Platform Ecosystem: The Case of Enterprise Software," *MIS Quarterly*, Vol. 36, No. 1, pp. 263-290, March 2012.
- 14. Dai, R., S. Narasimhan, and D.J. Wu, "Buyer's Efficient E-Sourcing Structure: Centralize or Decentralize?" *Journal of Management Information Systems*, Vol. 22, No. 2, pp. 141-164, Fall 2005.
- 15. Wu, D.J., P. Kleindorfer, and Y. Sun, "Optimal Capacity Expansion in the Presence of Capacity Options," *Decision Support Systems*, Vol. 40, No. 3-4, pp. 553-561, October 2005.
- 16. Wu, D.J. and P. Kleindorfer, "Competitive Options, Supply Contracting, and Electronic Markets," *Management Science*, Vol. 51, No. 3, pp. 452-466, March 2005.
- 17. Kleindorfer, P. and D.J. Wu, "Integrating Long- and Short-term Contracting via Business-to-Business Exchanges for Capital-Intensive Industries," *Management Science*, Vol. 49, No. 11, pp. 1597-1615, November 2003.
- 18. Levi, M., P. Kleindorfer, and D.J. Wu, "Codifiability, Relationship-Specific Information Technology Investment, and Optimal Contracting," *Journal of Management Information Systems*, Vol. 20, No. 2, pp. 77-98, Fall 2003.
- 19. Hitt, L., D.J. Wu, and X. Zhou, "Investment in Enterprise Resource Planning: Business Impact and Productivity Measures," *Journal of Management Information Systems*, Vol. 19, No. 1, pp. 71-98, Summer 2002.
- 20. Wu, D.J. and Y. Sun, "Cooperation in Multi-Agent Bidding," *Decision Support Systems*, Vol. 33, No. 3, pp. 335-347, July 2002.

- 21. Kimbrough, S., D.J. Wu, and F. Zhong, "Computers Play the Beer Game: Can Artificial Agents Manage Supply Chains?" *Decision Support Systems*, Vol. 33, No. 3, pp. 323-333, July 2002.
- 22. Wu, D.J., P. Kleindorfer, and J.E. Zhang, "Optimal Bidding and Contracting Strategies for Capital-Intensive Goods," *European Journal of Operational Research*, Vol. 137, No. 3, pp. 653-672, March 2002.
- 23. Kleindorfer, P., D.J. Wu, and C. Fernando, "Strategic Gaming in Electric Power Market," *European Journal of Operational Research*, Vol. 130, No. 1, pp. 156-168, April 2001.
- 24. Zhong, F., S. Kimbrough, and D.J. Wu, "Cooperative Agent Systems: Artificial Agents Play the Ultimatum Game," *Journal of Group Decision and Negotiation*, Vol. 11, No. 6, pp. 433-447, November 2002.
- 25. Wu, D.J., "Software Agents for Knowledge Management: Coordination in Multi-Agent Supply Chains and Auctions," *Expert Systems with Applications*, Vol. 20, No. 1, pp. 51-64, January 2001.
- 26. Lohse, G. and D.J. Wu, "Eye Movement Patterns on Chinese Yellow Pages Advertising," *International Journal of Electronic Markets*, Vol. 11, No. 2, pp. 87-96, Spring 2001.
- 27. Wu, D.J., "Agent-Based Stochastic Production Lines Design," *International Journal of Intelligent Systems in Accounting, Finance and Management*, Vol. 9, No. 4, pp. 257–270, December 2000.
- 28. Wu, D.J., Y. Sun, and F. Zhong, "Organizational Agent Systems for Intelligent Enterprise Modeling," *International Journal of Electronic Markets*, Vol. 10, No. 4, pp. 272–281, November 2000.
- 29. Wu, D.J., "Artificial Agents for Discovering Business Strategies for Network Industries," *International Journal of Electronic Commerce*, Vol. 5, No. 1, pp. 9-36, Fall 2000.
- 30. Wu, D.J., "Discovering Near-Optimal Pricing Strategies for the Deregulated Electric Power Marketplace Using Genetic Algorithms," *Decision Support Systems*, Vol. 27, No. 1-2, pp. 25–45, November 1999.

OTHER JOURNAL PUBLICATIONS

- 31. Caro, F., J. E. Colliard, E. Katok, A. Ockenfels, N. Stier-Moses, C. Tucker, and D. J. Wu, "Call for Papers—Management Science Special Issue on the Human-Algorithm Connection," *Management Science*, article in advance, December 13, 2021. https://pubsonline.informs.org/doi/abs/10.1287/mnsc.2021.4260.
- 32. Ceccagnoli, M., C. Forman, P. Huang, and D.J. Wu, "Digital Platforms: When is Participation Valuable?" *Communications of the ACM* (CACM), Vol. 57, No. 2, pp. 38-39, February 2014.
- 33. Kauffman, R. J., T. A. Weber, and D.J. Wu, "Guest Editors' Introduction for the Special Section on Information and Competitive Strategy in a Networked Economy," *Journal of Management Information Systems*, Vol. 29, No. 2, pp. 7 10, Fall 2012.
- 34. Wu, D.J., "Special Editor's Introduction to the Continuation of the Special Issue on Formal Modeling of Electronic Commerce," *Journal of Group Decision and Negotiation*, Vol. 12, No. 1, pp. 1-1, January 2003.
- 35. Wu, D.J., "Special Editor's Introduction to the Special Issue on Formal Modeling of Electronic Commerce," *Journal of Group Decision and Negotiation*, Vol. 11, No. 6, pp. 429-431, November 2002.
- 36. Kimbrough, S. and D.J. Wu, "Formal Models of Electronic Commerce: Introduction to the Special Issue," *International Journal of Electronic Commerce*, Vol. 5, No. 1, pp. 5–7, Fall 2000.

BOOK

37. Kimbrough, S.O. and D.J. Wu (Eds.), *Formal Modelling in Electronic Commerce*, Series: International Handbooks on Information Systems, Berlin: Springer, 2005.

PAPERS UNDER PEER REVIEW OR WOKRING PAPERS (Partial List)

- 38. Xiao, L., D.J. Wu and M. Ding, "A Smart Ad Display System," under 2nd round of review.
- 39. Aral, S., E. Brynjolfsson, C. Gu, H. Wang, and D.J. Wu, "Estimating the Returns to Streamlined Enterprise Systems: The Virtuous Cycle of Investment and Use in Streamlined Enterprise Systems," under 2nd round of review.
- 40. Yao, J., M. Lin, and D.J. Wu, "Revealed Wisdom of the Crowd: Informational Value of Bids," under revision for resubmission.
- 41. Lu, Z., Y. Dou, D.J. Wu, and J. Chen, "Selling Smart and Connected Products: A Value Chain Perspective," under initial round of review.
- 42. Dou, Y., D. J. Wu and X. Zhang, "Intertemporal Platform Competition in the Two-Sided Market: Reexamining the Seesaw Principle for Startup Platforms," under initial round of review.
- 43. Hu, H., Y. Dou, M. Niculescu, and D.J. Wu, "Score High with a Free Kick: Seeding vs. Time-Limited Freemium as Catalysts for the Adoption of Software," Work-in-progress. Earlier version presented at CIST 2019, POMS 2021.
- 44. Dou, Y., M. Niculescu, and D.J. Wu, "Software Adoption under Network Effects: Optimal Seeding, Sequencing, and Pricing," Working Paper, Georgia Tech Scheller College of Business. Earlier version presented at ICIS.
- 45. Deng, S.J. and D.J. Wu, "Pricing Tradable Capacity Options," Working Paper, Georgia Tech College of Engineering (ISyE) and Scheller College of Business. Earlier version presented at Google.

PEER REVIEWED CONFERENCE PUBLICATIONS WITH PROCEEDINGS

- 1. Frutiger, M., E. Overby, and D.J. Wu, "Is Social Network Platform Integration Valuable for an Online Service? A Randomized Field Experiment and Archival Data Analysis," *Proceedings of the 35th International Conference on Information Systems* (ICIS), Auckland, New Zealand, December 14-17, 2014.
- 2. Retana, G., C. Forman, S. Narasimhan, M. Niculescu, and D.J. Wu, "Technical Support and IT Capacity Demand: Evidence from the Cloud," *Proceedings of the 33rd International Conference on Information Systems* (ICIS), Orlando, Florida, December 16-19, 2012.
- 3. Dou, Y., D.J. Wu, and J. Chen, "Platform Pricing with Strategic Buyers," *Proceedings of the Forty-fifth Annual Hawaii International Conference on System Sciences* (HICSS), Maui, Hawaii, January 4-7, 2012.
- 4. Dou, Y., M. Niculescu, and D.J. Wu, "Software Adoption under Network Effects: Optimal Seeding, Sequencing, and Pricing," *Proceedings of the 32nd International Conference on Information Systems* (ICIS), Shanghai, China, December 4-7, 2011.
- 5. Huang, P., M. Ceccagnoli, C. Forman, and D.J. Wu, "When Do ISVs Join a Platform Ecosystem? Evidence from the Enterprise Software Industry," *Proceedings of the 30th International Conference on*

- Information Systems (ICIS), Phoenix, Arizona, 2009. http://aisel.aisnet.org/icis2009/161. Runner-Up Best Conference Paper Award.
- 6. Zhong, F. and D.J. Wu, "E-Sourcing: Impact of Bidding Behavior and Non-Price Attributes," *Proceedings of the 27th International Conference on Information Systems* (ICIS), pp. 1979-1998, Milwaukee, Wisconsin, 2006. http://aisel.aisnet.org/icis2006/118. Best Paper on Web-based Information Systems and Applications.
- 7. Aral, S., E. Brynjolfsson, and D.J. Wu, "Which Came First, IT or Productivity? The 'Virtuous Cycle' of Investment and Use in Enterprise Systems," *Proceedings of the 27th International Conference on Information Systems* (ICIS), Milwaukee, Wisconsin, pp. 1819-1839, 2006. **Best Paper on Valuing IT Opportunities.**
- 8. Dai, R., S. Narasimhan, and D.J. Wu, "E-Sourcing: Buyer's Efficient Structure for Purchasing Preparation Process," in: R.H. Sprague, Jr. (Ed.), *Proceedings of the Thirty-eighth Annual Hawaii International Conference on System Sciences* (HICSS), IEEE Computer Society Press, Los Alamitos, California, 2005.
- 9. Wu, D.J., M. Ding, and L. Hitt, "Learning in ERP Contracting: A Principal-Agent Analysis," in: R.H. Sprague, Jr. (Ed.), *Proceedings of the Thirty-seventh Annual Hawaii International Conference on System Sciences* (HICSS), IEEE Computer Society Press, Los Alamitos, California, 2004.
- 10. Kimbrough, S., M. Lu, D. Wood, and D.J. Wu, "Exploring a Two-Population Genetic Algorithm," in: E. Cantú-Paz et al. (Eds.), *GECCO-2003: Proceedings of the Genetic and Evolutionary Computation Conference*, Lecture Notes in Computer Science 2723, Berlin: Springer-Verlag, pp. 1148-1159, 2003.
- 11. Levi, M., P. Kleindorfer, and D.J. Wu, "Codifiability, Relationship-Specific IT Investment and Optimal Contracting," in: R.H. Sprague, Jr. (Ed.), *Proceedings of the Thirty-Sixth Annual Hawaii International Conference on System Sciences* (HICSS), IEEE Computer Society Press, Los Alamitos, California, 2003.
- 12. Kimbrough, S., M. Lu, D. Wood, and D.J. Wu, "Exploring a Two-Market Genetic Algorithm," in: W.B. Langdon et al. (Eds.), *GECCO-2002: Proceedings of the Genetic and Evolutionary Computation Conference*, Morgan Kaufmann Publishers, San Francisco, California, pp. 415-422, 2002.
- 13. Wu, D.J., S. Kimbrough, and F. Zhong, "Artificial Agents Play the Mad Mex Trust Game: A Computational Approach," in: R.H. Sprague, Jr. (Ed.), *Proceedings of the Thirty-fifth Annual Hawaii International Conference on System Sciences* (HICSS), IEEE Computer Society Press, Los Alamitos, California, 2002.
- 14. Wu, D.J., P. Kleindorfer, and Y. Sun, "Optimal Electric Power Capacity Expansion in the Presence of Capacity Options," in: R.H. Sprague, Jr. (Ed.), *Proceedings of the Thirty-fifth Annual Hawaii International Conference on System Sciences* (HICSS), IEEE Computer Society Press, Los Alamitos, California, 2002.
- 15. Zhong, F., S. Kimbrough, and D.J. Wu, "Cooperative Agent Systems: Artificial Agents Play the Ultimatum Game," in: R.H. Sprague, Jr. (Ed.), *Proceedings of the Thirty-fifth Annual Hawaii International Conference on System Sciences* (HICSS), IEEE Computer Society Press, Los Alamitos, California, 2002.
- 16. Wood, D., H. Bi, S. Kimbrough, D.J. Wu, and J. Chen, "DNA Starts to Learn Poker," in: N. Jonoska and N.C. Seeman (Eds.), *DNA Computing*, Lecture Notes in Computer Science, Berlin: Springer-Verlag, pp. 92-103, 2002.
- 17. Wu, D.J. and Y. Sun, "Multi-Agent Bidding and Contracting for Non-Storable Goods," in: R.H. Sprague, Jr. (Ed.), *Proceedings of the Thirty-fourth Annual Hawaii International Conference on System Sciences* (HICSS), IEEE Computer Society Press, Los Alamitos, California, 2001.

- 18. Wu, D.J. and Y. Sun, "The Emergence of Trust in Multi-Agent Bidding: A Computational Approach," in: R.H. Sprague, Jr. (Ed.), *Proceedings of the Thirty-fourth Annual Hawaii International Conference on System Sciences* (HICSS), IEEE Computer Society Press, Los Alamitos, California, 2001.
- 19. Kimbrough, S., D.J. Wu, and F. Zhong, "Computers Play the Beer Game: Can Artificial Agents Manage the Supply Chain?" in: R.H. Sprague, Jr. (Ed.), *Proceedings of the Thirty-fourth Annual Hawaii International Conference on System Sciences* (HICSS), IEEE Computer Society Press, Los Alamitos, California, 2001.
- 20. Wu, D.J., P. Kleindorfer, and J. E. Zhang, "Optimal Bidding and Contracting Strategies in the Deregulated Electric Power Market: Part II," in: R.H. Sprague, Jr. (Ed.), *Proceedings of the Thirty-fourth Annual Hawaii International Conference on System Sciences* (HICSS), IEEE Computer Society Press, Los Alamitos, California, 2001.
- 21. Wu, D.J., "Shop Floor Production Community Design: Artificial Agents Based Approach," in: R.H. Sprague, Jr. (Ed.), *Proceedings of the Thirty-third Annual Hawaii International Conference on System Sciences* (HICSS), IEEE Computer Society Press, Los Alamitos, California, 2000.
- 22. Kleindorfer, P., D.J. Wu, and C. Fernando, "Strategic Gaming in Electric Power Market," in: R.H. Sprague, Jr. (Ed.), *Proceedings of the Thirty-third Annual Hawaii International Conference on System Sciences* (HICSS), IEEE Computer Society Press, Los Alamitos, California, 2000.
- 23. Wu, D.J., P.R. Kleindorfer, and J.E. Zhang, "Optimal Bidding and Contracting Strategies in the Deregulated Electric Power Market: Part I," in: R.H. Sprague, Jr. (Ed.), *Proceedings of the Thirty-third Annual Hawaii International Conference on System Sciences* (HICSS), IEEE Computer Society Press, Los Alamitos, California, 2000.
- 24. Wu, D.J., "Constraint Programming Applications in Designing Electronic Agents: An Experimental Study," in: R.H. Sprague, Jr. (Ed.), *Proceedings of the Thirty-second Annual Hawaii International Conference on System Sciences* (HICSS), IEEE Computer Society Press, Los Alamitos, California, 1999.
- 25. Kleindorfer, P., D.J. Wu, and J.E. Zhang, "Optimal Long-Term Contracting in the Deregulated Electric Power Market," in: K. Bartkus, M. Parent, R. Jenson (Eds.), *Decision Science Institute 1998 Proceedings*, Vol. 3, pp. 1645–1648, Published by Decision Sciences Institute, Atlanta, Georgia, 1998.

PEER REVIEWED CONFERENCE PUBLICATIONS WITHOUT PROCEEDINGS

- 1. Lu, Z., Y. Dou, D.J. Wu, and J. Chen, "Commercializing Smart and Connected Products: A Value Chain Perspective," *Workshop on Information Systems and Economics* (Virtual WISE), December 16 19, 2020.
- 2. Hu, H., Y. Dou, M. Niculescu, and D.J. Wu, "Score High with a Free Kick: Seeding vs. Time-Limited Freemium as Catalysts for the Adoption of Software Under Perpetual Licensing," *INFORMS CIST*, Seattle, Washington, October 19 20, 2019.*
- 3. Dou, Y. and D.J. Wu, "Dynamic Platform Competition: Optimal Pricing and Piggybacking under Network Effects," *INFORMS CIST*, Houston, Texas, October 21 22, 2017.
- 4. Niculescu, M.F., D.J. Wu and L.Z. Xu, "Strategic Intellectual Property Sharing: Competition on an Open Technology Platform under Network Effects," *ISR Special Issue Research Workshop on Digital Infrastructures and Platforms*, University of Warwick, Coventry, UK, April 7 8, 2017.

- 5. Dou, Y. and D.J. Wu, "Dynamic Platform Competition: Optimal Subsidizing Strategies," *Workshop on Information Systems and Economics* (WISE), Dallas, Texas, December 12-13, 2015.
- 6. Xu, L.Z., M. F. Niculescu, and D.J. Wu, "When to Use the Open Business Model for Software Products under Network Effects?" *Workshop on Information Systems and Economics* (WISE), Auckland, New Zealand, December 17-19, 2014.
- 7. Frutiger, M., E. Overby, and D.J. Wu, "Is Social Network Platform Integration Valuable for an Online Service? A Randomized Field Experiment and Archival Data Analysis," *INFORMS CIST*, San Francisco, California, November 8 9, 2014.
- 8. Retana, G., C. Forman, and D.J. Wu, "Early Proactive Education, Customer Retention, and Demand for Technology Support: Evidence from a Field Experiment," *INFORMS CIST*, San Francisco, California, November 8 9, 2014.
- 9. Dou, Y., Y. Hu, and D.J. Wu, "License or Subscription? Pricing Information Goods with Value Depreciation and Network Effects," *Workshop on Information Systems and Economics* (WISE), Milan, Italy, December 19-20, 2013.
- 10. Frutiger, M., E. Overby, and D.J. Wu, "Is Offering Social Network Service Integration Valuable for a Web Site? A Randomized Field Experiment," *Workshop on Information Systems and Economics* (WISE), Milan, Italy, December 19-20, 2013.*
- 11. Frutiger, M., E. Overby, and D.J. Wu, "When Worlds Collide: User Reaction to the Integration of Real and Virtual Worlds, with Implications for Virtual World Platforms," 73rd Annual Meeting of the Academy of Management (AOM), Lake Buena Vista (Orlando), Florida, August 9-13, 2013.*
- 12. Huang, P., M. Ceccagnoli, C. Forman, and D.J. Wu, "Information Technology Knowledge Spillovers and Productivity: Evidence from Enterprise Software," *Academy of Management* (AOM) *Paper Symposium on Information Technology Spillovers*, Lake Buena Vista (Orlando), Florida, August 9-13, 2013.
- 13. Huang, P., M. Ceccagnoli, C. Forman, and D.J. Wu, "Information Technology Knowledge Spillovers and Productivity: Evidence from Enterprise Software," *National Bureau of Economic Research* (NBER) Summer Institute, Economics of IT and Digitization Workshop, Cambridge, MA, July 18, 2013.
- 14. Huang, P., M. Ceccagnoli, C. Forman, and D.J. Wu, "Network of Practice, Information Technology Knowledge Spillovers, and Productivity: Evidence from Enterprise Software," *Workshop on Information Systems and Economics* (WISE), Orlando, FL, December 15-16, 2012.*
- 15. Dou, Y., M. Niculescu, and D.J. Wu, "Engineering Optimal Network Effects via Social Media Features and Seeding in Markets for Digital Goods and Services," *Workshop on Information Systems and Economics* (WISE), Orlando, FL, December 15-16, 2012.
- 16. Dou, Y., M. Niculescu, and D.J. Wu, "Engineering Optimal Network Effects via Social Media Features and Seeding in Digital Goods Market," *ISR Special Issue Workshop on Social Media and Business Transformation*, University of Maryland, June 2, 2012.
- 17. Retana, G., C. Forman, S. Narasimhan, M. Niculescu, and D.J. Wu, "Providers' Technical Support and IT Capacity Usage: Evidence from the Cloud," Poster Presentation, *University of Utah's Winter Conference on Business Intelligence* (WCBI), Snowbird, UT, March 2012.*

- 18. Retana, G., S. Narasimhan, M. Niculescu, and D.J. Wu, "Cloud Usage: Role of Scalability and Online Technical Support," Poster Presentation, *Workshop on Information Systems and Economics* (WISE), Shanghai, December 7-9, 2011.*
- 19. Dou, Y., M. Niculescu, and D.J. Wu, "Optimal Consumer Network Structure Formation under Network Effects: Seeds Controllability and Visibility," *Workshop on Information Systems and Economics* (WISE), Shanghai, December 7-9, 2011.*
- 20. Niculescu, M. and D.J. Wu, "When Should Software Firms Commercialize New Products via Freemium Business Models?," *Workshop on Information Systems and Economics* (WISE), St. Louis, December 11-12, 2010.
- 21. Huang, P., M. Ceccagnoli, C. Forman, and D.J. Wu, "Participation in a Platform Ecosystem: Appropriability, Competition, and Access to the Installed Base," *Academy of Management* (AOM) *Paper Symposium on Platform Markets*, Montréal, Canada, August 6-10, 2010.
- 22. Ceccagnoli, M., C. Forman, P. Huang, and D.J. Wu, "Co-Creation of Value in a Platform Ecosystem: The Case of Enterprise Software," *Workshop on Information Systems and Economics* (WISE), Phoenix, Arizona, December 2009.
- 23. Huang, P., M. Ceccagnoli, C. Forman, and D.J. Wu, "Participation in a Platform Ecosystem: Appropriability, Competition, and Access to the Installed Base," *9th Annual Roundtable for Engineering Entrepreneurship Research* (REER), Atlanta, Georgia, November 2009.
- 24. Wu, D.J., M. Ding, and L. Hitt, "IT Implementation Contract Design: Analytical and Experimental Investigation of IT Payoff, Learning and Contract Structure," *Workshop on Information Systems and Economics* (WISE), Paris, France, December 13-14, 2008.
- 25. Zhong, F., T. Tunca, and D.J. Wu, "An Empirical Analysis of Price, Quality, and Incumbency in Online Procurement Auctions," *Workshop on Information Systems and Economics* (WISE), Montreal, Canada, December 8-9, 2007.
- Aral, S., E. Brynjolfsson, and D.J. Wu, "Which Came First, IT or Productivity? The Virtuous Cycle of Investment and Use in Enterprise Systems," *National Bureau of Economic Research* (NBER) Summer Institute Productivity Potpourri, July 18, 2007.
- 27. Deng, S.J. and D.J. Wu, "Pricing Tradable Capacity Options," *The International Conference on Manufacturing & Service Operations Management*, Tsinghua University, China, June 18-19, 2007.
- 28. Zhong, F. and D.J. Wu, "Supplier Learning in Repeated Online Procurement Auctions," *Workshop on Information Systems and Economics* (WISE), Northwestern University, December 9-10, 2006.
- 29. Aral, A., E. Brynjolfsson, and D.J. Wu, "Does Process Enabling IT Matter? Measuring the Business Value of Extended Enterprise Systems," *Workshop on Information Systems and Economics* (WISE), University of California, Irvine, December 10-11, 2005.
- 30. Zhong, F. and D.J. Wu, "Auctioning Procurement Contracts: Impact of Strategic Bidding Behavior, Non-Price Attributes and Evidence from Panel Data," *Workshop on Information Systems and Economics* (WISE), University of California, Irvine, December 10-11, 2005.*
- 31. Zhong, F, D.J. Wu, S. Narasimhan, and H. Zhang, "Internet Auction Equilibrium Selection: Theory, Evidence, and Impact of Strategic Bidding Behavior," *Workshop on Information Systems and Economics* (WISE), University of Maryland, College Park, December 11-12, 2004.*

- 32. Ding, M., D.J. Wu, and L. Hitt, "ERP Outsourcing: Efficient IT Contract Structures," *Workshop on Information Systems and Economics* (WISE), IESE Business School, Barcelona, December 14-15, 2002.
- 33. Wu, D.J., M. Levi, and P. R. Kleindorfer, "eExchanges Finding the Optimal Mix Between Contracts and Spot Markets in the Presence of Knowledge Uncodifiability," *Workshop on Information Systems and Economics* (WISE), New Orleans, Louisiana, December 15-16, 2001.

OTHER CONFERENCE PUBLICATIONS WITHOUT PROCEEDINGS

- 1. Hu, H., Y. Dou, M. Niculescu, and D.J. Wu, "Score High with a Free Kick: Seeding vs. Time-Limited Freemium as Catalysts for the Adoption of Software," *POMS 31st Annual Conference*, Online, April 30 May 5, 2021.*
- 2. Hu, H., M. Niculescu, Y. Dou, D.J. Wu, "Commercializing Software Applications Under Perpetual Licensing: is Seeding Still Relevant in the Age of Time-limited Freemium?" *INFORMS Annual Meeting*, Seattle, Washington, October 20 23, 2019.*
- 3. Lu, Z., Y. Dou, D.J. Wu, and J. Chen, "Seeding and Selling Network Goods: A Channel Coordination Perspective," *China Workshop on Economics of Information Systems Theory* (CWEIST), Xi'an, China, July 9, 2019.
- 4. Dou, Y. and D.J. Wu, "Platform Competition under Network Effects: Piggybacking and Optimal Subsidization," *Theory in Economics of Information Systems* (TEIS), Vancouver, Canada, March 16 17, 2019.
- 5. Niculescu, M.F., D.J. Wu and L.Z. Xu, "Strategic Intellectual Property Sharing: Competition on an Open Technology Platform under Network Effects" *Theory in Economics of Information Systems* (TEIS), Sonoma, CA, March 18 19, 2017.
- 6. Niculescu, M.F., D.J. Wu and L.Z. Xu, "When to Use the Open Business Model for Software Products under Network Effects?" *INFORMS Annual Meeting*, Nashville, Tennessee, November 13 –16, 2016.
- 7. Xu, L.Z., M. F. Niculescu, and D.J. Wu, "When to Use the Open Business Model for Software Products under Network Effects?" Georgia Institute of Technology, Scheller College of Business, *The Sandra (Sandy) A. Slaughter Software Conference*, Atlanta, GA, May 8, 2015.
- 8. Dou, Y., Y. Hu, and D.J. Wu, "Selling or Leasing? Pricing Information Goods with Depreciation of Consumer Valuation," *Theory in Economics of Information Systems* (TEIS), Banff, Alberta, Canada, March 13 16, 2015.
- 9. Frutiger, M., E. Overby, and D.J. Wu, "Is Social Network Platform Integration Valuable for an Online Service? A Randomized Field Experiment and Archival Data Analysis," *The Conference on Digital Experimentation @ MIT* (CODE@MIT), Cambridge, MA, October 10 11, 2014.*
- 10. Retana, G., C. Forman, and D.J. Wu, "Proactive Customer Education, Customer Retention, and Demand for Technology Support: Evidence from a Field Experiment," *The Conference on Digital Experimentation @ MIT* (CODE@MIT), Cambridge, MA, October 10-11, 2014.*
- 11. Dou, Y., Y. Hu, and D.J. Wu, "License or Subscription? Pricing Information Goods with Value Depreciation and Network Effects," *POMS 25th Annual Conference*, Atlanta, GA, May 9-12, 2014.

- 12. Retana, G., C. Forman, S. Narasimhan, M. Niculescu, and D.J. Wu, "Not all Cloud Users are Equal: Who Benefits from Technical Support?," *INFORMS 2012 Annual Meeting*, Phoenix, AZ, October 2012.*
- 13. Dou, Y., M. Niculescu, and D.J. Wu, "Engineering Optimal Network Effects via Social Media Features and Seeding in Digital Goods Market," *Theory in Economics of Information Systems* (TEIS), Laguna Beach, CA, June 9, 2012.
- 14. Niculescu, M. and D.J. Wu, "Economics of Free Under Perpetual Licensing: Implications for the Software Industry," *Theory in Economics of Information Systems* (TEIS), Laguna Beach, CA, June 9, 2012.
- 15. Retana, G., C. Forman, S. Narasimhan, M. Niculescu, and D.J. Wu, "Providers' Technical Support, IT Capacity Usage and Architecture Complexity: Evidence from the Cloud," 2012 Atlanta-Athens Conference on Research in Information Systems (AACRIS), Atlanta, Georgia, March 2012.*
- 16. Retana, G., S. Narasimhan, M. Niculescu, and D.J. Wu, "Measuring the Value of Cloud Scalability and Technical Support," *INFORMS Annual Meeting*, Charlotte, NC, November 13, 2011.*
- 17. Niculescu, M. and D.J. Wu, "When Should Software Firms Commercialize New Products via Freemium Business Models?," *INFORMS Annual Meeting*, Austin, Texas, November 10, 2010.
- 18. Ceccagnoli, M., C. Forman, P. Huang, and D.J. Wu, "Co-Creation of Value in a Platform Ecosystem: The Case of Enterprise Software," *ICT & Economic Growth Conference*, Munich, Germany, November 4-6, 2010.
- 19. Huang, P., M. Ceccagnoli, C. Forman, and D.J. Wu, "Participation in a Platform Ecosystem: Appropriability, Competition, and Access to the Installed Base," *Industry Studies Association Conference*, Chicago, IL, May 2010.
- 20. Huang, P., M. Ceccagnoli, C. Forman, and D.J. Wu, "Participation in a Platform Ecosystem: Appropriability, Competition, and Access to the Installed Base," *Open and User Innovation Conference*, Boston, MA, August 2010.
- 21. Niculescu, M. and D.J. Wu, "Freemium: A Software Innovation Diffusion Model," *The 3rd Conference of the Overseas Chinese Scholars Association in Management Sciences and Engineering*, Beijing, China, July 12, 2010.
- 22. Tunca, T., D.J. Wu, and F. Zhong, "An Empirical Analysis of Price, Quality, and Incumbency in Service Procurement Auctions," *INFORMS Annual Meeting*, San Diego, California, October 2009.
- 23. Ceccagnoli, M., C. Forman, P. Huang, and D.J. Wu, "Measuring the Business Value of Participation in the SAP Ecosystem: The Case of ISVs," Poster Presentation, *the 3rd Annual SAP Sponsored Academic Research Conference*, Mountain View, California, August 2009.
- 24. Tunca, T., D.J. Wu, and F. Zhong, "An Empirical Analysis of Price, Quality, and Incumbency in Service Procurement Auctions," *The 2nd Conference of the Overseas Chinese Scholars Association in Management Sciences and Engineering*, Shanghai, China, July, 2009.
- 25. Tunca, T., D.J. Wu, and F. Zhong, "An Empirical Analysis of Price, Quality, and Incumbency in Service Procurement Auctions," *Conference in Honor of Michael H. Rothkopf*, Penn State University Park, Smeal College of Business, June 1-3, 2009.

- 26. Wu, D.J., M. Ding, and L. Hitt, "IT Implementation Contract Design: Analytical and Experimental Investigation of IT Payoff, Learning and Contract Structure," *The Inaugural Conference of the Overseas Chinese Scholars Association in Management Sciences and Engineering*, July 4-5, 2008, Shanghai, China.
- 27. Zhong, F., T. Tunca, and D.J. Wu, "Value of e-Procurement of Business Services: An Empirical Analysis," *INFORMS National Meeting*, Seattle, November 5, 2007.
- 28. Deng, S.J. and D.J. Wu, "Pricing Options Contracts in Capacity Exchanges: A Continuous-Time Model," *Integrated Finance and Operations Management* (IFOM) *Workshop*, Tepper School of Business, Carnegie Mellon University, August 21-22, 2006.
- 29. Deng, S.J. and D.J. Wu, "Pricing Options Contracts in Capacity Exchanges: A Continuous-Time Model," *INFORMS Annual Meeting*, San Francisco, November 2005.
- 30. Wu, D.J. and P. Kleindorfer, "Optimal Bidding and Contracting Strategies for Non-storable Goods with Applications to Electricity Trading," Exelon Corporation (Formerly PECO Energy), Philadelphia, September 2000.
- 31. Wu, D.J., S. Kimbrough, and F. Zhong, "Artificial Agents Play the Beer Game: Eliminate the Bullwhip Effect," *Formal Modeling in Electronic Commerce Workshop*, The Wharton School, Philadelphia, PA, May 2000.
- 32. Wu, D.J. and Y. Sun, "Multi-Agent Auction, Bidding and Contracting Support System," *Formal Modeling in Electronic Commerce Workshop*, The Wharton School, Philadelphia, PA, May 2000.
- 33. Wu, D.J., "Optimal Bidding, Investment and Contracting Strategies in Supply Chains for Non-storable Goods," *INFORMS National Meeting*, Philadelphia, PA, November 1999.
- 34. Wu, D.J., "Software Agents for Exploring Business Strategies," *INFORMS National Meeting*, Cincinnati, OH, May 1999.
- 35. Wu, D.J., "Strategic Gaming and the Evolving Electric Power Market," *INFORMS National Meeting*, San Diego, CA, April 1997.
- 36. Wu, D.J., "Neural Networks and Genetic Algorithms with Implications for Network Industries," *Advanced Workshop in Regulation and Competition*, Rutgers University, Rutgers Business School, Newark, January 1997.
- 37. Kleindorfer, P. and D.J. Wu, "Providing Efficient Transmission Service," *Advanced Utility Workshop*, Rutgers University, Rutgers Business School, Newark, January 1996.
- 38. Wu, D.J., "Discrete Network Structure Design with Applications," *ORSA/TIMS Joint National Meeting*, Los Angeles, CA, April 1995.
- 39. Wu, D.J., "Computation of Optimal Replenishment Policies with Joint Setup Cost", *ORSA/TIMS Joint National Meeting*, Phoenix, AZ, November 1993.

PRESENTATIONS (Partial List)

INVITED SEMINARS

^{*}Indicates a presentation by one of my Ph.D. students or visiting Ph.D. students.

- 1. University of Delaware, Lerner College of Business and Economics, May 13, 2022 (scheduled).
- 2. University of Minnesota, Carlson School of Management, May 6, 2022 (scheduled).
- 3. Northeastern University (virtual), Network Science Institute, December 16, 2021.
- 4. London Business School (virtual), December 9, 2021.
- 5. Boston College (virtual), Carroll School of Management, December 3, 2021.
- 6. University of British Columbia (virtual), Sauder School of Business, November 5, 2021.
- 7. University of Maryland (virtual), Robert H. Smith School of Business, October 15, 2021.
- 8. University of Georgia (virtual), September 3, 2021.
- 9. University of Science and Technology, China (virtual), July 7, 2021.
- 10. University of Southern California (virtual), Marshall School of Business, April 30, 2021.
- 11. University of Bremen (virtual), April 14, 2021.
- 12. Carnegie Mellon University (virtual), Tepper School of Business, April 9, 2021.
- 13. University of Texas at Dallas (virtual), April 2, 2021.
- 14. RSM Erasmus University (virtual), The Netherlands, March 26, 2021.
- 15. MIT (virtual), Initiative on the Digital Economy, February 25, 2021.
- 16. Purdue University (virtual), Krannert School of Management, December 11, 2020.
- 17. University of North Texas (virtual), G. Bryant Ryan College of Business, December 4, 2020.
- 18. Lehigh University (virtual), College of Business, November 20, 2020.
- 19. City University of New York, Baruch College, October 15, 2019.
- 20. Temple University, October 11, 2019.
- 21. University of Texas, Austin, September 26, 2019.
- 22. University of Electronics Science and Technology of China (UESTC), School of Management and Economics, Chengdu, China, July 2, 2019.
- 23. National University of Singapore, School of Computing, IS Summer Workshop, June 27 28, 2019.
- 24. Jiangsu University of Science and Technology, June 15 16, 2019.
- 25. Tianjin University, Tianjin, China, April 30, 2019.
- 26. Harvard University, Harvard Business School, December 12, 2018.
- 27. University of Utah, David Eccles School of Business, April 27, 2018.
- 28. University of California, Irvine, The Paul Merage School of Business, December 7, 2017.
- 29. Stanford University, Center for Design Research, December 5, 2017.
- 30. University of Michigan, Ann Arbor, Ross School of Business, September 22, 2017.
- 31. Harbin Institute of Technology, China, MIS Summer Program, July 9, 2017.
- 32. University of Electronics Science and Technology of China (UESTC), School of Management and Economics, Chengdu, China, July 3, 2017.
- 33. Peking University, Guanghua School of Management, China, March 22, 2017.
- 34. University of Georgia, Terry College of Business, March 3, 2017.
- 35. Tsinghua University, School of Economics and Management, Beijing, China, December 8, 2016.
- 36. Georgia State University, CIS Colloquium, February 19, 2016.
- 37. Tulane University, A.B. Freeman School of Business, November 20, 2015.
- 38. Fudan University, School of Management, Shanghai, China, November 9, 2015.
- 39. Tsinghua University, School of Economics and Management, Beijing, China, November 3, 2015.
- 40. University of North Carolina, Charlotte, Belk College of Business, October 9, 2015.
- 41. Shanghai Jiaotong University, Antai College of Economics and Management, China, July 4, 2015.
- 42. Fudan University, School of Management, Shanghai, China, June 24, 2015.
- 43. Temple University, Fox School of Business, June 5, 2015.
- 44. Southern Methodist University, Cox School of Business, April 10, 2015.
- 45. University of California, Davis, Graduate School of Management, November 7, 2014.
- 46. Shanghai Jiaotong University, Antai College of Economics and Management, China, July 1, 2014.
- 47. University of Electronics Science and Technology of China (UESTC), School of Management and Economics, Chengdu, China, June 23, 2014.
- 48. Arizona State University, W. P. Carey School of Business, March 17, 2014.
- 49. University of Florida, Warrington College of Business Administration, February 28, 2014.

- 50. Ecole Polytechnique Fédérale de Lausanne (EPFL, English: Swiss Federal Institute of Technology in Lausanne), Switzerland, December 17, 2013.
- 51. University of Rochester, Simon School of Business, October 25, 2013.
- 52. The Wharton School, University of Pennsylvania, September 24, 2013.
- 53. Tsinghua University, School of Economics and Management, Beijing, China, July 3, 2013.
- 54. Beihang University, School of Economics and Management, Beijing, China, July 3, 2013.
- 55. Shanghai Jiaotong University, Antai College of Economics and Management, China, June 20, 2013.
- 56. Fudan University, School of Management, Shanghai, China, June 18, 2013.
- 57. University of Electronics Science and Technology of China (UESTC) (two talks), School of Management and Economics, Chengdu, China, June 5 6, 2013.
- 58. Harvard University, Harvard Business School, May 9, 2013.
- 59. University of Texas at Dallas, Naveen Jindal School of Management, March 22, 2013.
- 60. University of California, Irvine, The Paul Merage School of Business, December 7, 2012.
- 61. Boston University, School of Management, November 30, 2012.
- 62. University of Utah, David Eccles School of Business, October 26, 2012.
- 63. University of Washington, Seattle, Foster School of Business, November 4, 2011.
- 64. Duke University, Fugua School of Business, October 28, 2011.
- 65. University of Georgia, Terry College of Business, October 22, 2010.
- 66. Peking University, Guanghua School of Management, China, July 6, 2010.
- 67. University of Electronics Science and Technology of China (UESTC), School of Management and Economics, Chengdu, China, June 16, 2010.
- 68. Carnegie Mellon University, Tepper School of Business, March 26, 2010.
- 69. University of Electronics Science and Technology of China (UESTC) (two talks), School of Management and Economics, Chengdu, China, June 26, 2009.
- 70. University of Maryland at College Park, Robert H. Smith School of Business, February 20, 2009.
- 71. University of Minnesota, Carlson School of Management, September 19, 2008.
- 72. Tsinghua University, School of Economics and Management, Beijing, China, June 16, 2008.
- 73. RSM Erasmus University, The Netherlands, November 20, 2007.
- 74. International Workshop on Interdisciplinary Research in Management Science & Engineering, H. Milton Stewart School of Industrial and Systems Engineering (ISyE), Georgia Tech, August 9, 2007.
- 75. Georgia Institute of Technology, College of Management, April 12, 2007.
- 76. Google (two talks), Mountain View, California, October 20, 2006.
- 77. University of California, Davis, October 19, 2006.
- 78. INSEAD, Fontainebleau, France, June 30, 2006.
- 79. University of Pennsylvania, The Wharton School, Risk Management Center, May 5, 2005.
- 80. Georgia Institute of Technology, College of Management, April 7, 2005.
- 81. University of Maryland at College Park, Robert H. Smith School of Business, December 3, 2004.
- 82. University of Southern California, Marshall School of Business, November 11, 2004.
- 83. University of California, Irvine, Graduate School of Management, November 12, 2004.
- 84. Georgia Institute of Technology, College of Management, January 2003.
- 85. Naval Postgraduate School, February 2001.
- 86. Pennsylvania State University at University Park, Smeal College of Business, November 2000.

OTHER PRESENTATIONS

- 1. Workshop on Information Systems and Economics, December 16-17, 2021, Discussant (virtual).
- 2. Workshop on Information Systems and Economics (virtual WISE), December 16-19, 2020, Discussant.
- 3. Platform Strategy Research Symposium, Boston University, July 25, 2013, Discussant.
- 4. Theory in Economics of Information Systems (TEIS), Lake Tahoe, CA, June 4-5, 2011, Discussant.
- 5. Workshop on Information Systems and Economics (WISE), St. Louis, December 11-12, 2010, Discussant.
- 6. The 10th Annual Roundtable for Engineering Entrepreneurship Research (REER), November 5-7, 2010, Discussant.

- 7. Workshop on Information Systems and Economics (WISE), Phoenix, Arizona, December 14-15, 2009, Discussant.
- 8. 20th Anniversary Symposium on Competitive Strategy, Economics and Information Systems, *The Fortieth Annual Hawaii International Conference on System Sciences*, Big Island, Hawaii, January 4, 2007, Invited Speaker.
- 9. Domestic and International e-Commerce and Supporting Technologies, *The International Alliance for Women* Business & Trade Mission, Hyatt Regency, Atlanta, Georgia, November 9, 2006, Featured Speaker.
- 10. *Integrated Finance and Operations Management (IFOM) Workshop* 1, Tepper School of Business, Carnegie Mellon University, August 21-22, 2006, Invited Participant.
- 11. *Information Systems Research* (ISR) Special Issue Workshop, University of Michigan, Ann Arbor, March 24-25, 2006, Invited Participant.
- 12. Workshop on Information Systems and Economics (WISE), University of California, Irvine, December 10-11, 2005, Discussant.
- 13. Thought Leadership Mini-Conference on Integrated Risk Management in Operations and Global Supply Chain Management, The Boeing Center on Technology, Information and Manufacturing at the Olin School of Business, Washington University in St. Louis (WUSTL), June 2004, Discussant.

GRANTS AND CONTRACTS

AS PRINCIPAL AND CO-PRINCIPAL INVESTIGATORS

- 1. Georgia Tech Center for International Business Education and Research (GT CIBER), "Commercializing Smart and Connected Products: A Value Chain Perspective," \$4,000, Principal Investigator, 2021.
- 2. Georgia Tech Center for International Business Education and Research (GT CIBER), "International Visits and Immigration Management: A Global Economic and Risk Analysis," \$3,750, Co-Principal Investigator, 2018.
- 3. *The Cecil B. Day Program*, "Enhancing Business Ethics Topics in the Electronic Commerce Course," \$2,000, Principal Investigator, 2015.
- 4. *Georgia Tech Center for International Business Education and Research* (GT CIBER), "Globalization of Technology Innovation Analysis of Digital Business Models," \$1,500, Principal Investigator, 2015.
- 5. *NET (Networks, Electronic Commerce, and Telecommunications) Institute*, "Optimal Consumer Network Formation under Network Effects: Seeds Controllability and Visibility," \$3,000, Principal Investigator, 2011, (with Yifan Dou and Marius Niculescu).
- 6. Georgia Tech Center for International Business Education and Research (GT CIBER), "Platform-Based Business Strategies for Global Diffusion of U.S. Software Innovation," \$2,000, Principal Investigator, 2011, (with Yifan Dou and Marius Niculescu).
- 7. *SAP Labs LLC*, Palo Alto (Donation), Group of the Chief Scientist, "Research Initiatives on Innovation in the Enterprise Software Industry," \$126,000, Principal Investigator, 2010-2013, (with Chris Forman).
- 8. *SAP Labs LLC*, Palo Alto (Grant), Group of the Chief Scientist, "IT and Intangible Assets," \$54,000, Principal Investigator, 2010-2012, (with Chris Forman).
- 9. *SAP Labs* (Sponsorship), Group of the Chief Scientist, "Workshop on Information Systems and Economics (WISE), 2011 Shanghai, China," \$10,000, Principal Investigator, 2011, (with Chris Forman).
- 10. SAP Global University Alliances (Sponsorship), "IT Teaching Workshop," \$8,658, Principal Investigator, 2010.
- 11. Kauffman Foundation and the Georgia Research Alliance (Roadmap for an Entrepreneurial Economy Initiative), "Freemium: A Model of Innovation Diffusion," \$10,000, Co-Principal Investigator, 2010-2011, (with Marius Niculescu).
- 12. NET (Networks, Electronic Commerce, and Telecommunications) Institute, "When Do Complementors Join a Platform? Some Evidence from the Enterprise Software Industry," \$3,000, Principal Investigator, 2009, (with Peng Huang, Marco Ceccagnoli, and Chris Forman).

- 13. *Kauffman Foundation and the Georgia Research Alliance* (Roadmap for an Entrepreneurial Economy Initiative), "Measuring How Users Influence Adoption of Enterprise Applications," \$15,000, Co-Principal Investigator, 2007-2008, (with Chris Forman).
- 14. Georgia Tech Center for International Business Education and Research (GT CIBER), "COP (Capacity Option Pricing): An Electronic Market for Global Capacity Sourcing," \$3,500, Principal Investigator, summer 2007, (with Shi-Jie Deng).
- 15. *Rich Foundation Grant*, "Incorporating Business Ethics Topics in the Electronic Commerce Course," \$7,100, Principal Investigator, summer 2007.
- 16. *SAP University Alliance Award*, "Living Enterprise: Adaptive Supply Chain Management," \$50,000, Principal Investigator, October 2002, (with Bay Arinze).
- 17. SAP University Alliance Award, "Business Strategy Formulation: Plug-and-Play Materials for SD, MM and CO Modules," \$50,000, Co-Principal Investigator, October 2002, (with Bay Arinze).
- 18. *SAP Grant*, "The Business Value of SAP/ERP Implementations in the Oil and Gas Sector," \$40,000, Principal Investigator, October 2002 (with Lorin Hitt and Paul Kleindofer).
- 19. 2001 SAP University Alliance Award, "Mobile Commerce," \$50,000, Co- Principal Investigator, October 2001, (with Bay Arinze).
- 20. ERP Grant, Lockheed Martin Corporation, \$50,000, Co-Principal Investigator, March 1999, (with Bay Arinze).
- 21. 1999 SAP University Alliance Award, \$100,000, Principal Investigator, January 1999, (with Bay Arinze).
- 22. *ERP Grant, Computer Science Corporation*, \$50,000, Co-Principal Investigator, September 1998, (with Bay Arinze).
- 23. Unisys Equipment Grant, \$177,000, Principal Investigator, August 1998, (with Bay Arinze).
- 24. *Hewlett-Packard University Equipment Grant*, \$191,758, Principal Investigator, July 1998, (with Bay Arinze).
- 25. *ERP Grant, Accenture* (Formerly Andersen Consulting), \$40,000, Co-Principal Investigator, June 1998, (with Bay Arinze).
- 26. ERP Grant, Bristol-Myers Squibb, \$30,000, Co-Principal Investigator, May 1998, (with Bay Arinze).
- 27. 1998 SAP University Alliance Award, \$75,000, Co-Principal Investigator, January 1998, (with Bay Arinze).

AS INVESTIGATOR

- 28. *National Science Foundation*, "Innovations in Business Intelligence: Drexel University's Partnership between Academia, Industry and the City of Philadelphia," \$599,128, Senior Personnel, November 2002—October 2004 (NSF Grant EHR-0227802; PI: Bay Arinze).
- 29. *National Science Foundation*, "Working Memory and Adaptive Choice Behavior," \$272,550, Senior Personnel, September 1997–August 2003 (NSF Grant SES-9709548; PI: Steven Kimbrough).

TEACHING

INDIVIDUAL DOCTORAL STUDENT GUIDANCE

- Hao Hu (expected 2023), Co-Advisor, GT SCOB, ITM Area.
- Michael D. Frutiger (2015), Committee Member, GT SCOB, ITM Area. Initial Placement: Clinical Assistant Professor, Arizona State University.
- German Retana (2013), Co-Advisor, GT SCOB, ITM Area. Initial Placement: Assistant Professor, INCAE, Costa Rica.
- Wen Wen (2012), Committee Member, GT SCOB, ITM Area. Initial Placement: University of Texas at Austin, McCombs School of Business.
- Peng Huang (2010), Advisor, GT SCOB, ITM Area. Initial Placement: Assistant Professor, University of Maryland (College Park), Robert H. Smith School of Business. Current Position: Associate Professor with Tenure, University of Maryland (College Park), Robert H. Smith School of Business.

- Fang (Vivian) Zhong (2007), Advisor, GT SCOB, ITM Area. Initial Placement: Assistant Professor, RSM Erasmus University, The Netherlands.
- Li (Shirley) Xiong (2005), Committee Member, GT College of Computing. Initial Placement: Assistant Professor, Emory University, Department of Math and Computer Science.

OTHER PH.D. COMMITTEE MEMBERS

- Yifan Liu, Georgia Institute of Technology, School of Industrial and Systems Engineering, defended April 2018. Initial Placement: Uber.
- Andriy Shapoval, Georgia Institute of Technology, School of Industrial and Systems Engineering, defended March 2014. Initial Placement: Post-doctoral Fellow, School of Industrial and Systems Engineering, Georgia Institute of Technology.
- Siddhartha Maheshwary, Georgia Institute of Technology, School of Industrial and Systems Engineering, defended July 2008. Initial Placement: Applied Decision Technologies, Inc.
- Yi He, Georgia Institute of Technology, School of Industrial and Systems Engineering, defended April 2008. Initial Placement: Pacific Gas and Electric Company.
- Se-Kyoung Oh, Georgia Institute of Technology, School of Industrial and Systems Engineering, defended October 2005. Initial Placement: Post-doctoral Fellow, College of Management, Georgia Institute of Technology.
- Zhendong Xia, Georgia Institute of Technology, School of Industrial and Systems Engineering, defended September 2005. Initial Placement: SunTrust Bank.

CO-ADVISOR FOR PH.D. SUMMER PAPERS

- Hongchang Wang, Co-Advisor, first year paper (2015), ITM Area.
- Yang Hui, Advisor, first year paper (2014), ITM Area.
- Peng Xie, Co-Advisor, first year paper (2013), ITM Area.
- Michael D. Frutiger, Co-Advisor, first (2011) and second year (2012) paper, ITM Area.
- Hyun Jung, Co-Advisor, first year paper (2009), Strategy Area.
- Zhe (Jewel) Qu, Co-Advisor, second year paper (2004), ITM Area. Initial Placement: Assistant Professor, University of Texas Pan American.
- Jifeng Luo, Co-Advisor, first year paper (2004), ITM Area. Initial Placement: Assistant Professor, Shanghai Jiao Tong University, Shanghai, China.

RESEARCH WITH MASTER STUDENTS

• Xiaoge Zhou (Wharton School, University of Pennsylvania), Committee Member, 2001.

RESEARCH WITH UNDERGRADUATE STUDENTS

Karan Jhurani, Co-Advisor, Senior Research Project, GT College of Computing, 2008.

OTHER TEACHING ACTIVITIES

Degree executive education

- IMBA 6260A: Global Supply Chain Management and Electronic Commerce.
- MOT 6115A: Technology Forecasting and Emerging Technologies.
- MOT 6107: Technology Strategies in Information Systems.

Non-degree executive education

- Coca-Cola Digital Leadership Program, June 2019.
- Gordon Institute of Business Science (GIBS), U. of Pretoria, South Africa (GT Residence), 2018, 2019.

- China Mobile University: IT Transformation and Innovation in the Digital Age (GT Residence).
- Tsinghua PBCSF Finance EMBA: Future Technology and Business Innovation (GT & Boston Residence).
- Tsinghua PBCSF Finance EMBA: Business Model Innovation in the Age of Big Data (GT Residence).
- Tsinghua PBCSF Finance EMBA: Big Data Program (GT Residence).
- INCAE Business School, Costa Rica, Global EMBA: Electronic Commerce (GT Residence).

Course development (new or revised)

- MGT 4056 (Undergrad): Electronic Commerce.
- MGT 4057 (Undergrad): Business Process Analysis and Design.
- MGT 6056 (MBA): Electronic Commerce.
- MGT 6056 (Evening MBA): Electronic Commerce.
- MGT 6056 (KIAT): Electronic Commerce.
- MGT 8803: Ph.D. Seminar in ITM.

Average student rating of teaching of all courses/levels is **4.9** (out of 5) in $\underline{\text{most recent three}}$ years (2019 – 2021). Average student rating of teaching of all courses/levels is **4.9** (out of 5) in $\underline{\text{most recent five}}$ years (2017 – 2021).

SERVICE

PROFESSIONAL CONTRIBUTIONS

Additional Editorial Positions

- 1. Guest Associate Editor:
 - a. Special Issue, *Information Systems Research*, "Market Design and Analytics," 2020
 - b. Information Systems Research, 2015
 - c. Management Science, Operations Management, 2010 2011
 - d. Management Science, Information Systems, 2005
 - e. Special Issue Editorial Board, *Information Systems Research*, "The Digitally Enabled Extended Enterprise in a Global Economy," 2007.
- 2. Guest/Special Editor:
 - a. Special Section on "Information and Competitive Strategy in a Networked Economy," *Journal of Management Information Systems*, Vol. 29 No. 2, 2012
 - b. *Information Technology and Management*, Volume 8, No. 2, 2007
 - c. Journal of Group Decision and Negotiation, Volume 16, No. 2 & No. 3, 2007
 - d. Proceedings of Ninth INFORMS Conference on Information Systems and Technology (CIST), 2004
 - e. *Journal of Group Decision and Negotiation*, Vol. 11, No. 6, 2002 (Volume I), and Vol. 12, No. 1, 2003 (Volume II)
 - f. *International Journal of Electronic Commerce*, Special Issue: Formal Aspects of Electronic Commerce, Vol. 5, No. 1, Fall 2000.
- 3. Associate Editor:
 - a. International Conference on Information Systems (ICIS), 2011, 2012, 2014, 2015, 2016
 - b. European Conference on Information Systems (ECIS), 2014
 - c. Ninth INFORMS Conference on Information Systems and Technology (CIST), 2004.

Program Chair, Track Chair, Keynote, Panelist, Session Chair

- 1. Program Co-Chair:
 - Workshop on IT Teaching (Virtual), SCOB, Georgia Institute of Technology, 2021
 - Theory in Economics of Information Systems (TEIS), Costa Rica, 2016
 - Sandra A. Slaughter Software Conference, Atlanta, GA, 2015

- China Summer Workshop on Information Management, Chengdu, China, 2014
- Workshop on Information Systems and Economics (WISE), Shanghai, China, 2011 (Raised over USD\$30,000 to fund WISE 2011 from SAP Labs, The National Natural Science Foundation of China, etc.)
- Workshop on IT Teaching, COM, Georgia Institute of Technology, Atlanta, GA, 2010
- INFORMS Conference on Information Systems and Technology (CIST), Denver, CO, 2004
- Formal Modeling in Electronic Commerce Workshop, Bologna, Italy, June 2005
- Formal Modeling in Electronic Commerce Workshop, The Wharton School, PA, May 2000.

2. Track Co-Chair:

- Production and Operations Management Conference, Atlanta, GA, 2014
- IS Track Co-Chair, The 3rd Conference of the Overseas Chinese Scholars Association in Management Sciences and Engineering, Beijing, China, July 12, 2010
- Economics of IS, International Conference on Information Systems, Phoenix, AZ, 2009
- e-Marketing & e-Businesses track, International Conference on Electronic Commerce, Xi'an, China, August 2005.

3. Keynote/Panelist:

- Panelist, Editors' panel (representing *Management Science*): Machine Learning in Business and IS Research, INFORMS Workshop on Data Science, November 13, 2021.
- Keynote speaker, China Summer Workshop on Information Management (virtual), June 2021.
- Panelist (representing *Management Science*), Academic Panel: Journal EiCs/DEs, Workshop on Information Technologies and Systems, December 17, 2020.
- Panelist, International Peer-Review Panel on the Discipline of Management Science and Engineering at Tianjin University, June, 2019.
- Panelist, Editors' panel (representing *Information Systems Research*), "Building a Business Data Science Community: Publishing Data Science Work in Premier Business Journals -- Best Practices and Issues," INFORMS Workshop on Data Science, October 19, 2019.
- Panelist, China Summer Workshop on Information Management, Nanjing, China, 2017
- Panel Co-chair, "WISE Celebration: Are We WISE About Sub-Fields in IS? Lessons from Forming and Sustaining a Research Community," The 30th International Conference on Information Systems, Phoenix, Arizona, December 2009
- Panelist, National Science Foundation, USA, Information Technology Research, 2000
- Panelist, Industry-University Partnerships in Enterprise Resource Planning, INFORMS National Meetings, Philadelphia, PA, November 1999.

4. Session Chair:

- Supply Chain Management, INFORMS National Meetings, Philadelphia, PA, November 1999
- Intelligent Systems, INFORMS National Meetings, Cincinnati, OH, May 1999.

Service in Professional Organizations (Partial List)

- 1. President (Elected), INFORMS Information Systems Society (ISS), November 2019 October 2021.
- 2. Chair, Best IS Paper in Management Science 2020, 2021.
- 3. Chair, INFORMS IS Society Sandra A. Slaughter Early Career Award Committee, 2015 2019.
- 4. INFORMS ISS Award Committee (ex-officio, President-ISS):
 - INFORMS Information Systems Society Distinguished Fellow Award 2021
 - INFORMS ISS Gordon B. Davis Young Scholar Award 2020, 2021
 - INFORMS Information Systems Society Practical Impacts Award 2020, 2021
 - INFORMS ISS Sandra A. Slaughter Early Career Award 2020, 2021
 - Inaugural INFORMS ISS Bapna-Ghose Social Justice Best Paper Award 2021
- 5. Advisory Member, Executive Council, China Association for Information Systems, 2005 present.
- 6. Best Student Paper Award Committee, INFORMS CIST, 2017, 2018, 2019 (chair).
- 7. Program Committee:

- INFORMS CIST, 2006, 2009 2021
- 9th China Goes Global Conference, Atlanta, 2015
- China Summer Workshop on Information Management, 2007, 2010 2013
- INFORMS International, Beijing, 2012.
- 8. Best Paper Award Committee, INFORMS e-Business section, 2020.
- 9. Chair, Best Paper Award Committee, China Summer Workshop on Information Management, 2015, 2016.
- 10. Review Board, Manufacturing & Service Operations Management Conference, Atlanta, GA, 2006.

Invited Thought Leadership

- 1. MIS Academic Leadership Conference, Invited Participant:
 - University of Texas, Dallas, 2019
 - Georgia State University, Atlanta, GA, 2016
 - University of Arizona, Tucson, AZ, 2015
 - University of Texas, Austin, 2014.
- 2. Workshop on IT Teaching, Co-Chair/Invited Participant/Speaker:
 - Georgia Institute of Technology (Program Co-Chair), 2021
 - Boston University, 2018
 - University of California, Irvine, Paul Merage School of Business (Speaker), 2017
 - Emory University, 2015
 - University of Maryland, Robert H. Smith School of Business, 2013
 - University of California, Irvine, Paul Merage School of Business, 2012
 - University of Michigan, Ann Arbor, Stephen Ross School of Business, 2011
 - Georgia Institute of Technology (Program Co-Chair), College of Management, 2010
 - University of Minnesota, Carlson School of Management, 2009
 - Stern School of Business (Speaker), New York University, 2008
 - Harvard University, Harvard Business School, 2006
 - Stanford University, Graduate School of Business, 2004.
- 3. Leadership Roundtable Participant, Georgia Tech Institute for Leadership and Entrepreneurship, 2007.
- 4. Semiconductor Summit, Semico Research Corp., Scottsdale, AZ, March 2003, Invited Academic Guest.
- 5. Wharton Forum on Electronic Supply Chain Management: Business-to-Business eCommerce, Wharton School, University of Pennsylvania, December 1999, Faculty Moderator.

Referee for

- 1. Technical Journals (partial list): Management Science, Information Systems Research, MIS Quarterly, Journal of Management Information Systems, Operations Research, Manufacturing & Service Operations Management, Production and Operations Management, Decision Support Systems, European Journal of Operational Research, IEEE Transactions on Systems, Man, and Cybernetics: Part A, IEEE Transactions on Systems, Man, and Cybernetics: Part C, Interface, Journal of Regulatory Economics.
- 2. Publishers: Stanford University Press, McGraw-Hill Press.
- 3. Foundations: National Science Foundation (USA), Research Grant Council of Hong Kong.
- 4. Government: US Department of Homeland Security.
- 5. Other University Faculty Promotion and Tenure Cases (2010 2022, promotion to full professor or associate professor with or without tenure, partial list): Arizona State University; Boston University; Boston College; Carnegie Mellon University (Tepper); Emory University; University of Delaware; HEC Paris, France; Hong Kong University of Science and Technology, China; India School of Business, India; National University of Singapore; Purdue University; Singapore Management University; Tsinghua

University, China; University of British Columbia, Canada; University of Connecticut, Storrs; UT Dallas; University of Maryland (Smith); University of Minnesota (Carlson); University of Notre Dame (Mendoza); University of Utah; University of Hong Kong, China; University of Pennsylvania (Wharton); University of Pittsburg (Katz); and University of Washington, Seattle (Foster).

CAMPUS CONTRIBUTIONS (Georgia Institute of Technology, Partial List)

- Area Coordinator, ITM, May 2014 present.
- Chair, Endowed Chair & Professorship Committee, SCOB, 2021-2022.
- Reappointment, Promotion, and Tenure (RPT) Committee Member, SCOB, 2020-2021.
- Scheller College Dean's Diversity & Inclusion Council, 2020-2021.
- Member, Georgia Tech Engage Faculty Council, 2022.
- Institute Graduate Curriculum Committee representing Scheller College of Business, 2020 2023.
- Institute Advisory Committee on Promotion of Research Faculty, 2007 2017.
- Chair/Co-Chair/Committee Member:
 - Technical Review Committee for Faculty Promotion and Tenure, SCOB, 2021, 2019, 2018, 2016, 2008, 2007
 - o ITM Faculty Search, SCOB, Georgia Tech, 2015 2019, 2010 2011, 2006 2007.
- Faculty Advisor, MBA Tech Management Club, 2015 2016.
- Faculty Co-Director, Tsinghua University People's Bank of China School of Finance EMBA:
 - o Future Technology and Business Innovation, 2016 (GT and Boston Residence)
 - o Business Model Innovation in the Age of Big Data, 2015 (GT Residence)
 - o Big Data Program, 2014 (GT Residence).
- Faculty Co-Director, China Mobile University:
 - o IT Transformation and Innovation in the Digital Age, 2014 (GT Residence).
- Director, SCOB China Program, 2006 3/2014.
- Participant, Strategic Planning Meetings, Institute of People and Technology, GT, 2011.
- Additional Committee Member:
 - o SCOB MBA Committee, 2006 2015
 - Provost's Taskforces for Excellence, Defining & Supporting Interdisciplinarity Taskforce,
 External Research Collaborations Subcommittee, 2007
 - o McDonough Chair in Finance, COM, Georgia Tech, 2007 2008
 - o CoM IT Committee, 2003 2010
 - o Costly Chair Search Committee, COM, Georgia Tech, 2011 2015, 2006 2007
 - o ITM Faculty Search Committee, COM, Georgia Tech, 2006 2018.

PROFESSIONAL MEMBERSHIPS

- Association for Computing Machinery (ACM)
- Association for Information Systems (AIS)
- Industry Studies Association (ISA)
- Institute for Operations Research and the Management Sciences (INFORMS)
- INFORMS Information Systems Society (ISS)

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