

Curriculum Vitae

Munindar P. Singh, Ph.D.

Department of Computer Science
North Carolina State University
Raleigh, NC 27695-8206, USA

(919) 515-5677

singh@ncsu.edu

<http://www.csc.ncsu.edu/faculty/mpsingh/>

ORCID: 0000-0003-3599-3893

Contents

| | | |
|-------|---|----|
| 1 | Brief Resume | 1 |
| 1.1 | Education | 1 |
| 1.2 | Professional Experience | 1 |
| 1.3 | Membership in Professional Organizations | 1 |
| 1.4 | Scholarly and Professional Honors | 2 |
| 2 | Mentoring Activities | 4 |
| 3 | Publications | 17 |
| 3.1 | Books | 17 |
| 3.2 | Edited Proceedings | 17 |
| 3.3 | Journal Articles | 18 |
| 3.4 | Papers in Major Conference Proceedings | 26 |
| 3.5 | Papers in Major Symposia and Workshop Proceedings | 37 |
| 3.6 | Papers in Other Refereed Proceedings | 38 |
| 3.7 | Book Chapters | 48 |
| 3.8 | Bulletin and Magazine Articles | 51 |
| 3.9 | Short Papers and Demonstration Abstracts | 51 |
| 3.10 | Technical Columns | 55 |
| 3.11 | Invited Forewords | 58 |
| 3.12 | Book Reviews | 58 |
| 3.13 | Editorials | 59 |
| 3.14 | Miscellaneous External Publications | 60 |
| 3.15 | Tutorial Notes | 61 |
| 3.16 | Invited Conference and Workshop Presentations | 62 |
| 3.17 | Other Invited Presentations | 66 |
| 3.18 | Impact of Scholarly Contributions | 68 |
| 4 | Patents | 70 |
| 5 | Research Sponsorship | 73 |
| 5.1 | Ongoing Research Activities | 73 |
| 5.2 | Past Research Activities | 74 |
| 5.3 | Research Sponsorship Obtained Prior to Joining NCSU | 78 |
| 5.3.1 | Other Service | 78 |
| 6 | Professional Activities | 78 |
| 6.1 | Advisory Boards of Research Projects | 78 |
| 6.2 | Service on Expert Panels | 79 |
| 6.3 | Editorships and Editorial Boards | 79 |
| 6.4 | Guest Editorships | 80 |
| 6.5 | Events Organized or Chaired | 81 |
| 6.6 | Steering Committee Memberships | 82 |
| 6.7 | Tenure and Promotion Reviewing | 82 |
| 6.8 | Research Proposal Reviewing | 84 |
| 6.9 | Dissertation Reviewing | 85 |
| 6.10 | Panels Chaired | 86 |
| 6.11 | Participation as Invited Panelist | 87 |
| 6.12 | Magazine Columns | 88 |
| 6.13 | Summer School Lectures | 88 |
| 6.14 | Conference Tutorials | 88 |
| 6.15 | Conference Senior Program Committee Memberships | 90 |
| 6.16 | Conference Program Committee Memberships | 91 |
| 6.17 | Symposia and Workshop Program Committee Memberships | 92 |
| 6.18 | Other Peer Reviewing | 94 |

1 Brief Resume

1.1 Education

- Ph.D. in Computer Sciences; University of Texas, Austin: 1993. *Dissertation Title*: “A Theory of Actions, Intentions, and Communications for Multiagent Systems.”
Doctoral Supervisors: Professors E. Allen Emerson (coadvisor) and Nicholas M. Asher (coadvisor).
- M.S.C.S., with a minor in Philosophy (logic); University of Texas, Austin: 1988.
- B.Tech. in Computer Science & Engineering; Indian Institute of Technology, Delhi, India: 1986.

1.2 Professional Experience

- March 2016–present: Alumni Distinguished Graduate Professor, NCSU, Raleigh, NC.
- February 2014–present: Co-Director, Science of Security Lablet, NCSU.
- August 2003–present: Full Professor, Computer Science, North Carolina State University, Raleigh.
- August 2000–July 2003: Associate Professor with tenure, Computer Science, North Carolina State University, Raleigh.
- August 1995–July 2000: Assistant Professor, Computer Science, North Carolina State University, Raleigh.
- December 1992–July 1995: Member of the Technical Staff, MCC, Austin.
- January 1992–November 1992: Associate Member of the Technical Staff, MCC, Austin.
- June 1989–August 1990 and September 1991–December 1991: Graduate Research Assistant, MCC, Austin.
- September 1990–May 1991: Graduate Research Assistant, Center for Cognitive Science, University of Texas.
- Visiting Summer Appointments: SRI International, Menlo Park, CA: Summer 1986 and 1987; DFKI (German Research Center for Artificial Intelligence), Kaiserslautern, Germany: Summer 1991.

1.3 Membership in Professional Organizations

- Association for the Advancement of Artificial Intelligence (AAAI): Fellow.
- American Association for the Advancement of Science (AAAS): Fellow.
- Association for Computing Machinery (ACM): Fellow.
- Academia Europaea: The Academy of Europe (AE): Foreign Member (honoris causa).
- Institute of Electrical and Electronics Engineers (IEEE) and its Computer Society: Fellow.

1.4 Scholarly and Professional Honors

- NCSU Thank a Teacher Recognition Letter (two students): Spring 2022.
- Fellow, Association for Computing Machinery (ACM): 2021.
- Carla Savage Awesome Award: Fall 2021.
- Foreign Member (honoris causa), Academia Europaea: The Academy of Europe (AE): 2021.
- Member, NCSU Academy of Outstanding Mentors: 2021.
- Outstanding Graduate Faculty Mentor Award (awarded by NCSU's Graduate School): 2021.
- Fellow, American Association for the Advancement of Science (AAAS): 2020.
- IEEE TCSVC Research Innovation Award: 2020.
- Facebook Research Award: 2020.
- Blue Sky Paper Award for paper [120]; this award is sponsored by the Computing Research Association's Computing Community Consortium: 2020.
- ACM/SIGAI Autonomous Agents Research Award: 2020.
- NCSU Thank a Teacher Recognition Letter (two students): Spring 2018.
- IBM Shared University Research Award: 2018.
- Member, NCSU Research Leadership Academy: 2017.
- NCSU Alumni Association Outstanding Research Award: 2017.
- Fellow, Association for the Advancement of Artificial Intelligence (AAAI): 2017.
- IBM Partnership Award: 2016.
- IFAAMAS Influential Paper Award: 2016. This award recognizes Paper [98]. IFAAMAS is the International Foundation for Autonomous Agents and MultiAgent Systems.
- NCSU Alumni Association Distinguished Graduate Professorship Award: 2016.
- NCSU Thank a Teacher Recognition Letter: Fall 2015.
- Best Paper Award at the *Thirteenth International Conference on Service-Oriented Computing (ICSOC)* for Paper [146]: 2015.
- NCSU Alumni Association Outstanding Research Award: 2015.
- Selection among the top 10% of the papers accepted at the *Thirteenth International Conference on Autonomous Agents and MultiAgent Systems (AAMAS)* of Paper [161]: 2014.
- Finalist for Best Senior Program Committee Member Award at the *Tenth International Conference on Autonomous Agents and MultiAgent Systems (AAMAS)*: 2011. Three out of 78 SPC members were named finalists.
- Fellow, Institute of Electrical and Electronics Engineers: 2009.

- Intel Research Council Faculty Award: 2007.
- IBM Partnership Award: 2007.
- Charter Member, Board of Directors, International Foundation for Autonomous Agents and Multiagent Systems (IFAAMAS): 2007–2012.
- Best Student Paper Award at the *Third IEEE International Conference on Services Computing (SCC)* for Paper [196]: 2006.
- Williams Evans Visiting Fellowship, University of Otago, Dunedin, New Zealand: June 2006.
- Selection as finalist for the Best Innovative System or Application Paper Award at the *Second International Joint Conference on Autonomous Agents and MultiAgent Systems* of Paper [216]: 2003.
- Cisco University Research Grant: 2000.
- IBM Partnership Award: 2000.
- Selection as one of the best papers at the *Third International Conference on Multiagent Systems (ICMAS)* of Paper [224]: July 1998.
- IBM Partnership Award: 1998.
- Nominated for a Packard Fellowship as one of two candidates from NCSU: 1998.
- IEEE Computer Society Distinguished Visitor: 1997–2000.
- Outstanding Reviewer, International Joint Conference on Artificial Intelligence (IJCAI): 1997. Fewer than 10% of the reviewers were considered outstanding.
- IBM Partnership Award: 1997.
- National Science Foundation CAREER Award: 1996–2000.
- IBM Partnership Award: 1996.
- Selection as one of the best papers at *Tenth IEEE Conference on Artificial Intelligence for Applications (CAIA)* of Paper [227]: 1994.
- Nomination to the Harvard Society of Fellows: 1992. I did not pursue this nomination.
- Microelectronics and Computer Development Fellowship from the University of Texas at Austin: 1986–1988. This is the highest award offered by this University at the graduate level.
- Merit Prizes for the First Position in three of four semesters in Junior and Senior years at the Indian Institute of Technology.
- National Talent Search Scholarship of India: 1980–1986.
- Junior Science Talent Scholarship of Delhi Administration, Delhi, India: 1978–1980.
- Merit prize in the National Mathematics Olympiad of India: 1980.

2 Mentoring Activities

Faculty Colleagues Mentored: Current Computer Science began a formal mentoring process in Fall 2000. I attended a workshop given by Rich Felder and Rebecca Brent, *Effective Mentoring*, NCSU College of Engineering, 7 September 2000.

1. Dr. Xiaorui Liu, Fall 2022–present.
2. Dr. Sandeep Kuttal, Fall 2022–present.
3. Dr. Sharma Thankachan, Fall 2022–present.
4. Dr. Collin Lynch, Spring 2016–present; reappointed.
5. Dr. Mohammed Shahzad, Fall 2015–present; promoted to Associate Professor and tenured.
6. Dr. Kemafor Anyanwu, Fall 2008–present; promoted to Associate Professor and tenured.

Faculty Colleagues Mentored: Former

7. Dr. Ranga Raju Vatsavai, Fall 2015–Spring 2020; tenured; subsequently promoted to Professor.
8. Dr. Rada Y. Chirkova, Fall 2015–Spring 2018; promoted to Professor.
9. Dr. Robert A. St. Amant, Spring 2007–Spring 2017; promoted to Professor.
10. Dr. Ben Watson, Spring 2006–Spring 2015; promoted to Associate Professor and tenured.
11. Dr. Ting Yu, Spring 2006–Spring 2013; promoted to Associate Professor and tenured.
12. Dr. James C. Lester, Spring 2006–Spring 2009; promoted to Professor.
13. Dr. Jaewoo Kang, Fall 2005–Spring 2007.
14. Dr. Jun Xu, Spring 2004–Spring 2007.
15. Dr. Peter R. Wurman, Summer 2000–Spring 2006; promoted to Associate Professor and tenured.

Current Doctoral Advisees The list below includes current Ph.D. students who have passed at least one research examination under my supervision. Additional students are in progress.

1. Ruijie Xi (qualified; expected graduation: December 2024).
2. Jiaqing Yuan (qualified; expected graduation: May 2024).
3. Amanul Haque (qualified; expected graduation: December 2024).
4. Vaibhav Garg (qualified; expected graduation: December 2024).
5. Sz-Ting Tzeng (proposed; expected graduation: May 2023).
6. Mu Zhu (proposed; expected graduation: May 2023).

Graduated Doctoral Advisees

1. Samuel H. Christie V, graduated Fall 2022.
2. Hui Guo, graduated Spring 2021.
3. Zhen Guo, graduated Spring 2021.
4. Karthik Sheshadri, graduated Summer 2019.
5. Nirav S. Ajmeri, graduated Fall 2018.
6. Mehdi Mashayekhi (coadvised with Dr. George List, Civil, Construction, and Environmental Engineering), graduated Fall 2016.
7. Adel Magdi El Messiry, graduated Fall 2016.
8. Anup K. Kalia, graduated Summer 2016.
9. Pradeep K. Murukannaiah, graduated Spring 2016.
10. Guangchao Yuan, graduated Spring 2016.
11. Zhe Zhang, graduated Fall 2014.
12. Pankaj R. Telang, graduated Spring 2013.
13. Scott N. Gerard, graduated Spring 2013.
14. Xibin Gao, graduated Summer 2012.
15. Chung-Wei Hang, graduated Summer 2011.
16. Derek J. Sollenberger, graduated Fall 2010.
17. Christopher J. Hazard, graduated Spring 2010.
18. Yonghong Wang, graduated Spring 2009.
19. Amit K. Chopra, graduated Fall 2008.
20. Yathiraj B. Udupi, graduated Spring 2008.
21. Qing Zhang (coadvised with Dr. Ting Yu), graduated Spring 2008.
22. Nirmitt V. Desai, graduated Fall 2007.
23. A. Soydan Bilgin (coadvised with Dr. Rada Y. Chirkova), graduated Fall 2007.
24. Zhengang Cheng (coadvised with Dr. Mladen A. Vouk), graduated Summer 2006.
25. Ashok U. Mallya, graduated Fall 2005.
26. E. Michael Maximilien, graduated Fall 2004.
27. Feng Wan, graduated Fall 2004.
28. Pinar Yolum, graduated Summer 2003.
29. Bin Yu, graduated Fall 2001.
30. Jie Xing, graduated Summer 2001.

Current Masters Advisees

1. Divya Sundaresan (expected graduation May 2023).

Graduated Masters Advisees I have graduated forty research Masters students. Of these, thirty students wrote theses under my direction; the remaining MS graduates obtained their degrees based on their Ph.D. written prelims (identified below).

1. Gurkirat Kang, graduated November 2022.
2. Rishabh Agrawal, graduated August 2021.
3. Suma Kasa, graduated May 2021.
4. Arvind Sastha Kumar, graduated May 2021.
5. Bhavana Balraj, graduated May 2021.
6. Aditya Parkhi, graduated May 2021.
7. Vinayak Dubey (coadvised with Dr. Tianfu Wu), graduated May 2021.
8. Shrey Anand, graduated Summer 2019.
9. Zhen Guo, graduated Fall 2018 based on Ph.D. written prelim.
10. Nirav Ajmeri, graduated Fall 2018 based on Ph.D. written prelim.
11. Shubham Goyal, graduated Spring 2018.
12. Samuel H. Christie V, graduated Spring 2017 based on Ph.D. written prelim.
13. Anup K. Kalia, graduated Fall 2013.
14. Guangchao Yuan, graduated Fall 2013 based on Ph.D. written prelim.
15. Zhe Zhang, graduated Spring 2012 based on Ph.D. written prelim.
16. Pradeep K. Murukannaiah, graduated Spring 2011 based on Ph.D. written prelim.
17. Pankaj R. Telang, graduated Fall 2010 based on Ph.D. written prelim.
18. Koushik N. Rajagopalan, graduated Spring 2010.
19. Derek J. Sollenberger, graduated Fall 2009 based on Ph.D. written prelim.
20. Narendran Ranjit, graduated Spring 2007.
21. Arvind Batalagundu Viswanathan, graduated Spring 2007.
22. Payal Chakravarty, graduated Spring 2007.
23. Yathiraj B. Udupi, graduated Fall 2005 based on Ph.D. written prelim.
24. Leena V. Wagle, graduated Summer 2005.
25. Amit K. Chopra, graduated Fall 2003.

26. A. Soydan Bilgin, graduated Summer 2003.
27. Srivatsa V. Chivukula, graduated Spring 2003.
28. E. Michael Maximilien, graduated Spring 2003 based on Ph.D. written prelim.
29. Ashok U. Mallya, graduated Fall 2002.
30. Raghuram M. Sreenath, graduated Fall 2002.
31. Subhayu S. Chatterjee, graduated Fall 2002.
32. Paul J. Palathingal, graduated Summer 2002.
33. Wentao Mo, graduated Summer 2001.
34. Mahmoud S. Elhaddad, graduated Summer 2001.
35. Pinar Yolum, graduated Summer 2000.
36. Mahadevan Venkatraman, graduated Summer 1999.
37. Sudhir K. Rustogi, graduated Summer 1999.
38. Anuj K. Jain, graduated Fall 1998.
39. Jiejun Kong, graduated Summer 1998.
40. Chubin Lin, graduated Spring 1998.

Postdoctoral Research Associates

1. Saikath Bhattacharya, April 2021–August 2022. Coadvised with Laurie Williams.
2. Nirav Ajmeri, January 2019–October 2020. Coadvised with Laurie Williams.
3. Özgür Kafalı, May 2015–December 2017. Coadvised with Laurie Williams.
4. Rahul Pandita, November 2015–August 2016. Coadvised with Laurie Williams.
5. Hongying Du, October 2014–May 2016. Coadvised with Jon Doyle.
6. Adrián Fernández Martínez, December 2012–June 2013.
7. Chung-Wei Hang, July 2011–June 2013.
8. Christopher J. Hazard, July 2010–February 2011.
9. Nirmitt V. Desai, January 2008–June 2008.
10. Bin Yu, January 2002–June 2003.

Research Assistants Unlike graduate research assistants, research assistants are full-time employees not concurrently pursuing a degree.

1. Michael J. Suralik, September 2001–December 2001.
2. Kevin Vaughan, November 1999–March 2000.
3. Mahadevan Venkatraman, August 1999–May 2000.
4. Sudhir K. Rustogi, August 1999–September 1999.

Current Graduate Research Assistants

1. Divya Sundaresan, January 2022–present.
2. Ruijie Xi, May 2020–August 2020 and January 2021–present.
3. Amanul Haque, January 2021–present.
4. Sz-Ting Tzeng, August 2021–present.
5. Gurkirat S. Kang, January 2021–December 2021.
6. Vaibhav Garg, January 2020–December 2020 and June 2021–present.
7. Mu Zhu, August 2017–present.

Past Graduate Research Assistants I have directed fifty-two graduate research assistants.

1. Zhen Guo, January 2017–May 2021.
2. Hui Guo, January 2017–May 2018 and May 2019–May 2021.
3. Aditya Parkhi, January 2020–December 2020.
4. Bhavana Balraj, January 2020–December 2020.
5. Arvind Kumar Sastha, January 2020–May 2020.
6. Vinayak Dubey, September 2019–December 2019.
7. Griffin C. Page, January 2019–December 2019.
8. Samuel Christie V, August 2014–December 2016 and October 2019–December 2019.
9. Iffat Anjum, August 2018–May 2019.
10. Shrey Anand, August 2018–December 2018.
11. Nirav Ajmeri, August 2012–August 2017 and January 2018–December 2018.
12. Shubham Goyal, August 2017–December 2017.
13. Pradeep Kumar Murukannaiah, November 2009–May 2016.
14. Guangchao Yuan, January 2013–May 2016.

15. Anup Kumar Kalia, January 2011–May 2015 and January 2016–May 2016.
16. Bennett Yates Narron, June 2014–December 2015.
17. Zhe Zhang, January 2010–May 2013.
18. Dhanwant Singh Kang, January 2011–May 2012.
19. Moin Ayazifar, August 2012–December 2012.
20. Prashant C. Kediya, September 2007–May 2009; January 2011–August 2012.
21. Chung-Wei Hang, August 2008–May 2011.
22. Kartik Tadanki, January 2009–December 2010.
23. Christopher J. Hazard, February 2010–July 2010.
24. Amit K. Chopra, August 2002–May 2008.
25. Yathiraj B. Udupi, August 2002–December 2003; January 2005–May 2007.
26. Nirmal V. Desai, August 2003–December 2003; May 2004–December 2007.
27. Ashok U. Mallya, May 2002–December 2005.
28. Yonghong Wang, August 2004–May 2005.
29. Leena V. Wagle, January 2004–June 2004.
30. Pinar Yolum, January 2000–June 2003.
31. A. Soydan Bilgin, May 2003–June 2003.
32. Raghuram M. Sreenath, January 2002–December 2002.
33. Paul J. Palathingal, January 2002–May 2002.
34. Bin Yu, August 1998–December 2001.
35. Jie Xing, January 1998–May 2001.
36. Wentao Mo, August 2000–May 2001.
37. Zhengang Cheng, January 2000–May 2000; January 2001–May 2001.
38. Mayank S. Ajmera, October 1999–May 2000.
39. Swati Kher, October 1999–May 2000.
40. Hong Ji, October 1999–May 2000.
41. Harish Kammanahalli, October 1999–May 2000.
42. Feng Wan, August 1997–December 1999.
43. Sudhir K. Rustogi, May 1998–August 1999.

44. Xiaokang Sang, January 1998–May 1998.
45. Mahadevan Venkatraman, August 1997–August 1999.
46. Jiejun Kong, January 1997–August 1998.
47. Yu Lei, January 1997–February 1998.
48. Chris L. Grove, January 1997–May 1998.
49. Anuj K. Jain, May 1996–May 1998.
50. Chubin Lin, May 1996–April 1997.
51. Neerja Bhatt, May 1996–July 1996.
52. Hong Han, January 1996–April 1996.

Graduate Fellows Supervised

1. Anup Kumar Kalia, ORISE Fellowship, May 2015–December 2015.
2. Zhe Zhang, IBM Ph.D. Fellowship, August 2013–December 2014.
3. Ricard López Fogués, TEE Fellowship, December 2012–December 2014.
4. Qanita Ahmad, Fulbright Fellowship, August 2012–December 2014.

Undergraduate Research Assistants

1. Joshua Myers, January 2020–May 2020.
2. Maya Umehara, January 2020–May 2020.
3. Samuel A. Ebert, January 2019–December 2019.
4. Luke M. Cunningham, January 2019–May 2019.
5. Gabriel K. Gloss, January 2019–May 2019.
6. Jonathan D. Schertz, January 2019–May 2019.
7. Samuel Rappl, January 2017–May 2018.
8. Priya Paul, May 2007–June 2007.
9. Naveen Z. Malik, September 1999–December 1999.
10. Chris L. Grove, May 1996–December 1996.

Doctoral Dissertations Directed I have graduated thirty Ph.D. students.

1. Samuel H. Christie V, *Information-Based Decentralized Systems*, Fall 2022.
Samuel is working on a startup.
2. Hui Guo, *Extraction and Analysis of Stories: Natural Language Processing for Software Engineering*, Spring 2021.
Hui joined Quora.
3. Zhen Guo, *Understanding Interaction and Persuasion in Online Argumentative Discussions*, Spring 2021.
Zhen joined eBay Research.
4. Karthik Sheshadri, *Toward a Unified Model of News Influence on Public Interest and Legislation*, Summer 2019.
Karthik works at Cisco Systems in California.
5. Nirav S. Ajmeri, *Engineering Multiagent Systems for Ethics and Privacy-Aware Social Computing*, Fall 2018.
Nirav Ajmeri is a lecturer in AI at the University of Bristol in UK.
6. Mehdi Mashayekhi, *Regulation of Open Normative Multiagent Systems*, Fall 2016.
Mehdi Mashayekhi works for Apple in California.
7. Adel Elmessiry, *Natural Language Techniques for Decision Support Based on Patient Complaints*, Fall 2016.
Adel Elmessiry is CTO of Legal Alignment in Nashville.
8. Anup K. Kalia, *Understanding Human Communication to Estimate Trust, Hierarchy, and Performance*, Summer 2016.
Anup Kalia joined IBM Research in Yorktown Heights.
9. Pradeep K. Murukannaiah, *Engineering Personal Agents Toward Personalized, Context-Aware, and Privacy-Preserving Applications*, Spring 2016.
Pradeep Murukannaiah is a tenured assistant professor at the Technical University of Delft in the Netherlands.
10. Guangchao Yuan, *Exploiting Content, Homophily, and Location for Understanding User Interactions in Social Media*, Spring 2016.
Guangchao Yuan joined Microsoft's Bing Local Search group in California.
11. Zhe Zhang, *Text Mining for Sentiment Analysis*, Fall 2014.
Zhe Zhang is a research scientist at Facebook in California.
12. Pankaj R. Telang, *Multiagent Business Modeling*, Summer 2013.
Pankaj Telang is with SAS Institute in Cary.

13. Scott N. Gerard, *Designing, Verifying, and Evolving Commitment-Based Business Protocols*, Summer 2013.
Scott Gerard is a senior technical staff member at IBM Research.
14. Xibin Gao, *Knowledge Discovery from Business Contracts*, Summer 2012.
Xibin Gao works at Morgan Stanley in New York.
15. Chung-Wei Hang, *Probabilistic Trust Models for Social and Service Networks*, Summer 2011.
Chung-Wei Hang is Amazon's Alexa AI group in New York.
16. Derek J. Sollenberger, *Engineering Personal and Social Affective Applications*, Fall 2010.
Derek Sollenberger is a senior software engineer with Google in Chapel Hill.
17. Christopher J. Hazard, *Trust and Reputation in Multiagent Systems: Strategies and Dynamics with Reference to Electronic Commerce*, Spring 2010.
Christopher Hazard has founded a gaming startup based in the Triangle.
18. Yonghong Wang, *Evidence-Based Trust in Distributed Agent Systems*, Spring 2009.
Yonghong Wang took up a postdoctoral fellowship at Carnegie Mellon University and now works for Apple in Cupertino.
19. Amit K. Chopra, *Commitment Alignment: Semantics, Patterns, and Decision Procedures for Distributed Computing*, Fall 2008.
Amit Chopra is a senior lecturer at Lancaster University in UK.
20. Yathiraj B. Udupi, *Modeling Service Engagements in Dynamic Organizations: Multiagent Model and Architecture for Policy-Based Governance*, Spring 2008.
Yathi Udupi is with the Cisco Systems CTO Office in San Jose.
21. Qing Zhang, *Microdata Privacy Protection Through Permutation-Based Approaches*, coadvised with Dr. Ting Yu, Spring 2008.
Qing Zhang is with Teradata in San Diego.
22. Nirmitt V. Desai, *Interorganizational Business Interactions: Contracts, Processes, Evolution*, Fall 2007.
Nirmitt Desai joined the IBM India Research Lab as a research staff member and moved to IBM Research in New York in 2014.
23. A. Soydan Bilgin, *Deriving Efficient SQL Sequences Via Prefetching*, coadvised with Dr. Rada Y. Chirkova, Fall 2007.
Soydan Bilgin is with Amazon in Seattle.
24. Zhengang Cheng, *Verifying Commitment-Based Business Protocols and their Compositions: Model Checking using Promela and Spin*, coadvised with Dr. Mladen A. Vouk, Summer 2006.
Zhangang Cheng is with SimpliCTI Technologies.
25. Ashok U. Mallya, *Modeling and Enacting Business Processes via Commitment Protocols Among Agents*, Fall 2005.
Ashok Mallya is with Apple in Cupertino.

26. E. Michael Maximilien, *Toward Autonomic Web Services Trust and Selection*, Fall 2004.
Michael Maximilien moved to IBM Almaden Research Center and is now a Distinguished Engineer.
27. Feng Wan, *Commitment-Based Business Process Modelling and Enactment*, Fall 2004.
Feng Wan is Principal Architect with SimpliCTI Technologies.
28. Pinar Yolum, *Emergent Properties of Referral Networks*, Summer 2003.
Pinar Yolum is a tenured full professor at Boğaziçi University in Istanbul but has taken indefinite leave to be an associate professor at Utrecht University in Netherlands.
29. Bin Yu, *Emergence and Evolution of Agent-Based Referral Networks*, Fall 2001.
Bin Yu is Director of Data Science at Macy's.
30. Jie Xing, *Commitment-Based Interoperation for E-Commerce*, Summer 2001.
Jie Xing works for SAS Institute.

Masters Theses Directed I have graduated forty research Masters students, of whom thirty wrote MS theses under my direction.

1. Gurkirat Kang, *Adaptive Defensive Deception in IT/OT Networks*, Fall 2022.
2. Rishabh Agrawal, *Using Explanations for Norm Emergence in Normative Multiagent Systems*, Fall 2021.
Rishabh Agrawal has joined Google.
3. Suma Kasa, *Adaptor Grammar for Unsupervised and Semi-Supervised Entity Extraction*, Summer 2021.
Suma Kasa joined Amazon.
4. Arvind Sashta Kumar, *Federated Inverse Averaging: Toward Pareto-Optimal Minima in Human Activity Recognition*, Summer 2021.
Arvind Sashta Kumar joined Facebook.
5. Bhavana Balraj, *Multilabel Active Learning for User Context Recognition In-the-Wild*, Summer 2021.
Bhavana Balraj joined Cisco.
6. Aditya Parkhi, *Novelty Detection in Textual Data using Document Encoders and Self Attention*, Summer 2021.
Aditya Parkhi joined Qualcomm.
7. Vinayak Dubey (coadvised with Dr. Tianfu Wu), *A Preliminary Study in Learning Attention to Prune Convolutional Neural Networks* Spring 2021.
Vinayak Dubey joined Amazon.
8. Shrey Anand, *Content-Based Creative Suggestions for User Queries*, Summer 2019.
Shrey Anand joined Red Hat in Raleigh.

9. Shubham Goyal, *Exploring Sanctions in CyberSecurity Compliance*, Spring 2018.
Shubham Goyal joined Amazon.
10. Anup Kumar Kalia, *Muon: Designing Multiagent Communication Protocols from Interaction Scenarios*, Fall 2013.
Anup Kalia continued on for a Ph.D. at NCSU.
11. Koushik Narayanan Rajagopalan, *Tools for Business Protocols*, Spring 2010.
Koushik Rajagopalan joined Epic Systems in Madison, Wisconsin.
12. Narendran Ranjit, *Multiagent Referral Systems through Social Networks*, Spring 2007.
Narendran Ranjit works for Symantec, Durham.
13. Arvind Batalagundu Viswanathan, *Modeling Social Networks as Multiagent Systems*, Spring 2007.
Arvind Viswanathan works for Cisco Systems in San Jose.
14. Payal Chakravarty, *An Event-Driven Approach to Agent-Based Business Process Enactment*, Spring 2007.
Payal Chakravarty joined IBM's Tivoli division.
15. Leena V. Wagle, *Incorporating Business Policies in Business Protocols*, Summer 2005.
Leena Wagle joined FedEx in Memphis.
16. Amit K. Chopra, *Nonmonotonic Commitment Machines*, Fall 2003.
Amit Chopra continued on for a Ph.D. at NCSU.
17. A. Soydan Bilgin, *Semantic Web Services Query and Manipulation Language*, Summer 2003.
Soydan Bilgin continued on for a Ph.D. at NCSU.
18. Srivatsa V. Chivukula, *Evolution of Trust in Anonymous Interactions*, Spring 2003.
Srivatsa Chivukula works for Qualcomm.
19. Ashok U. Mallya, *Specifying and Resolving Temporal Commitments*, Fall 2002.
Ashok Mallya continued on for a Ph.D. at NCSU.
20. Raghuram M. Sreenath, *A Community-Based Rating System for Selecting among Web Services*, Fall 2002.
Raghuram Sreenath is with IBM, Bengaluru in India.
21. Subhayu S. Chatterjee, *Instant Messaging Interface and Transport for the Multiagent Referral System*, Fall 2002.
Subhayu Chatterjee is with GreyOrange Inc. in Texas.
22. Paul J. Palathingal, *Integrating Information Retrieval in a Referral System for Knowledge Management*, Summer 2002.
Paul Palathingal works for Oak Ridge National Laboratory.
23. Wentao Mo, *A Referral-Based Recommender System for E-Commerce*, Summer 2001.

24. Mahmoud S. Elhaddad, *Adaptive Multipath Traffic Allocation in TCP/IP Networks*, Summer 2001.
Mahmoud Elhaddad took up graduate studies in Pittsburgh to be closer to his wife.
25. Pinar Yolum, *Flexible Execution of E-Commerce Protocols: A Commitment-Based Approach*, Summer 2000.
Pinar Yolum continued on for a Ph.D. at NCSU.
26. Mahadevan Venkatraman, *Specifying and Verifying Compliance with Commitment Protocols Among Autonomous Agents*, Summer 1999.
Mahadevan Venkatraman works for Facebook.
27. Sudhir K. Rustogi, *Empirical Studies of Coordination in Decentralized Multiagent Systems*, Summer 1999.
Sudhir Rustogi works for Cisco Systems in RTP.
28. Anuj K. Jain, *Maintaining Process Coherence in Heterogeneous Information Environments*, Fall 1998.
Anuj Jain works for CitiBank.
29. Jiejun Kong, *Constructing Multiagent Systems: The MEP Project*, Summer 1998.
Jiejun Kong moved to Los Angeles for graduate studies.
30. Chubin Lin, *Design and Implementation of a Distributed Workflow Scheduler*, Spring 1998.
Chubin Lin works for Unisys in Virginia.

Publications with Advisees The following publications are coauthored with graduate and postdoctoral advisees and, on occasion, with undergraduates and visiting students.

- *Journals*: A total of fifty-nine articles.
[19], [20], [22], [26], [25], [30], [31], [33], [34], [35], [36], [37], [38], [39], [41], [42], [44], [46], [47], [48], [49], [51], [52], [53], [54], [55], [56], [57], [59], [60], [61], [63], [64], [66], [67], [68], [69], [70], [72], [73], [74], [75], [76], [77], [78], [79], [80], [81], [83], [84], [85], [86], [87], [88], [89], [90], [91], [93], and [95].
- *Major conferences and symposia*: A total of eighty-nine articles.
[108], [109], [110], [111], [112], [113], [114], [115], [116], [118], [119], [120], [121], [122], [125], [128], [129], [132], [133], [134], [135], [136], [137], [138], [139], [140], [141], [142], [143], [146], [147], [148], [149], [155], [156], [158], [160], [161], [162], [163], [164], [165], [166], [169], [171], [173], [177], [178], [179], [180], [181], [182], [183], [184], [186], [187], [188], [189], [190], [191], [194], [195], [196], [197], [198], [199], [200], [201], [202], [203], [204], [205], [206], [207], [208], [210], [211], [212], [214], [215], [216], [217], [218], [219], [220], [222], [236], [237], and [238].
- *Other refereed conferences and symposia*: A total of sixty-four articles.
[242], [243], [248], [246], [247], [249], [250], [252], [253], [255], [258], [259], [260], [262], [264], [265], [266], [267], [269], [270], [271], [272], [275], [276], [282], [283], [284], [286], [287], [288], [289], [290], [291], [292], [293], [294], [295], [296], [297], [298], [300], [301], [302], [303], [306], [307], [308], [309], [310], [311], [312], [313], [315], [316], [317], [319], [320], [321], [322], [324], [325], [329], [333], and [336].

- *Book chapters*: A total of three articles.
[358], [362], and [367].
- *Bulletin and magazine articles*: A total of four articles.
[384], [385], [386], and [387].
- *Technical columns*: A total of four articles.
[427], [431], [434], and [435].
- *Short Papers and Demonstration Abstracts*: A total of twenty-six articles.
[389], [390], [391], [392], [393], [394], [395], [396], [398], [399], [400], [403], [404], [410], [411],
[412], [413], [414], [415], [416], [417], [418], [419], [420], [421], and [422].
- *Miscellaneous external publications*: A total of four articles.
[494], [495], [497], and [498].

3 Publications

I have included acceptance ratios where such were available; for a special issue, generally the ratio is for the issue. Final versions of all “in press” papers have been delivered.

3.1 Books

- [1] Munindar P. Singh and Michael N. Huhns. *Service-Oriented Computing: Semantics, Processes, Agents*. Chichester, United Kingdom: John Wiley & Sons, 2005. doi: 10.1002/0470091509.

This book was adopted in courses at universities in several countries, including Australia, Canada, China, France, India, Japan, New Zealand, Portugal, Tunisia, Turkey, and UK.

A Chinese translation of this book was published by Tsinghua University Press in December 2012.

- Lu Chang Hui (translator). 面向服务的计算：语义、流程和代理. Beijing: Tsinghua University Press, 2012. Chinese ISBN: 978-7-302-27468-1.

- [2] Munindar P. Singh, editor. *The Practical Handbook of Internet Computing*. Baton Rouge: Chapman Hall & CRC Press, 2005. doi: 10.1201/9780203507223.

This handbook, which includes 56 contributed chapters, appears in the *Computer and Information Science Series* edited by Professor Sartaj Sahni. Professor Sahni invited me to edit this handbook.

- [3] Michael N. Huhns and Munindar P. Singh, editors. *Readings in Agents*. San Francisco: Morgan Kaufmann, 1998. ISBN: 9780080515809.

- [4] Munindar P. Singh. *Multiagent Systems: A Theoretical Framework for Intentions, Know-How, and Communications*. Lecture Notes in Computer Science 799. Available at <http://www.csc.ncsu.edu/faculty/mpsingh/books/MAS/>. Heidelberg: Springer, 1994. doi: 10.1007/BFb0030531.

3.2 Edited Proceedings

- [5] Claudio Agostino Ardagna, Hongyi Bian, Carl K. Chang, Rong N. Chang, Ernesto Damiani, Schahram Dustdar, Jordi Marco, Munindar P. Singh, Ernest Teniente, Robert Ward, Zhongjie Wang, Fatos Xhafa, and Jia Zhang, editors. *Proceedings of the IEEE International Conference on Services Computing (SCC)*. Barcelona: IEEE, July 2022. ISBN: 978-1-6654-8146-5. doi: 10.1109/SCC55611.2022.

- [6] Munindar P. Singh, Laurie Williams, Rick Kuhn, and Tao Xie, editors. *Proceedings of the 5th Annual Symposium and Bootcamp on Hot Topics in the Science of Security (HoTSoS)*. Raleigh, North Carolina: ACM, April 2018. doi: 10.1145/3190619.

- [7] David M. Nicol and Munindar P. Singh, editors. *Proceedings of the International Symposium and Bootcamp on the Science of Security (HotSoS)*. Raleigh, North Carolina: ACM, April 2014. doi: 10.1145/2600176.

- [8] Longbing Cao, Yifeng Zeng, Andreas L. Symeonidis, Vladimir Gorodetsky, Philip S. Yu, and Munindar P. Singh, editors. *Proceedings of the 8th International Workshop on Agents and Data Mining Interaction*. Lecture Notes in Computer Science 7607. Heidelberg: Springer, 2013. doi: 10.1007/978-3-642-36288-0.

- [9] Guido Boella, Gabriella Pigozzi, Munindar P. Singh, and Harko Verhagen, editors. *Proceedings of the 3rd International Workshop on Normative Multiagent Systems (NorMAS)*. Luxembourg, July 2008.

- [10] Rino Falcone, Suzanne Barber, Jordi Sabater-Mir, and Munindar P. Singh, editors. *Proceedings of the 11th International TRUST Workshop*. Lecture Notes in Computer Science 5396. Heidelberg: Springer, 2008. doi: 10.1007/978-3-540-92803-4.
- [11] Frank Dignum, Virginia Dignum, Sven Koenig, Sarit Kraus, Munindar P. Singh, and Michael Wooldridge, editors. *Proceedings of the 4th International Joint Conference on Autonomous Agents and MultiAgent Systems (AAMAS)*. Utrecht, The Netherlands: ACM Press, 2005. doi: 10.1145/1082473.
- [12] Rino Falcone, Suzanne Barber, Jordi Sabater-Mir, and Munindar P. Singh, editors. *Trusting Agents for Trusting Electronic Societies: Theory and Applications in HCI and E-Commerce: Proceedings of the 6th and the 7th International Workshops on Trust in Agent Societies*. Lecture Notes in Computer Science 3577. Berlin: Springer, 2005. doi: 10.1007/11532095.
- [13] Gianluca Moro, Claudio Sartori, and Munindar P. Singh, editors. *Proceedings of the 2nd International Workshop on Agents and Peer-to-Peer Computing*. Lecture Notes in Computer Science 2872. Heidelberg: Springer, 2005. doi: 10.1007/b104265.
- [14] Rino Falcone, Suzanne Barber, Larry Korba, and Munindar P. Singh, editors. *Trust, Reputation, and Security: Theories and Practice*. Lecture Notes in Computer Science 2631. Berlin: Springer, 2003. doi: 10.1007/3-540-36609-1.
- [15] Rino Falcone, Munindar P. Singh, and Yao-Hua Tan, editors. *Trust in Cyber-Societies: Integrating the Human and Artificial Perspectives*. Lecture Notes in Computer Science 2246. Berlin: Springer, 2001. doi: 10.1007/3-540-45547-7.
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3.3 Journal Articles

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- [22] Mehdi Mashayekhi, Nirav Ajmeri, George F. List, and Munindar P. Singh. “Prosocial Norm Emergence in Multiagent Systems.” *ACM Transactions on Autonomous and Adaptive Systems (TAAS)* 17(1–2), June 2022, 3:1–3:24. doi: 10.1145/3540202.
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- [26] Samuel H. Christie V, Amit K. Chopra, and Munindar P. Singh. “Mandrake: Multiagent Systems as a Basis for Programming Fault-Tolerant Decentralized Applications.” *Journal of Autonomous Agents and Multi-Agent Systems (JAAMAS)* 36(1), April 2022, 16:1–16:30. doi: 10.1007/s10458-021-09540-8.
- [27] Francisco Bráulio Oliveira, Amanul Haque, Davoud Mougouei, Simon Evans, Jaime Simão Sichman, and Munindar P. Singh. “Investigating the Emotional Response to COVID-19 News on Twitter: A Topic Modelling and Emotion Classification Approach.” *IEEE Access* 10, February 2022, pages 16883–16897. doi: 10.1109/ACCESS.2022.3150329.
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- **Selected for a Journal First presentation at the International Conference on Software Engineering (ICSE) 2020.**
- [40] Munindar P. Singh and Amit K. Chopra. “Computational Governance and Violable Contracts for Blockchain Applications.” *IEEE Computer* 53(1), January 2020, pages 53–62. doi: 10.1109/MC.2019.2947372.
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3.10 Technical Columns

Internet Ethics: Fairness, Accountability, Transparency The following are articles from the Internet Ethics: Fairness, Accountability, Transparency department, which I coedit for *IEEE Internet Computing*.

- [425] Munindar P. Singh and Pradeep K. Murukannaiah. “Toward an Ethical Framework for Smart Cities and the Internet of Things.” *IEEE Internet Computing (IC)* 27(1), January 2023. In press, pages 1–6. doi: 10.1109/MIC.2023.3236826.
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- [433] Christopher J. Hazard and Munindar P. Singh. “Privacy Risks in Intelligent User Interfaces.” *IEEE Internet Computing (IC)* 20(6), November 2016, pages 57–61. doi: 10.1109/MIC.2016.116.
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- [434] Pradeep K. Murukannaiah, Nirav Ajmeri, and Munindar P. Singh. “Engineering Privacy in Social Applications.” *IEEE Internet Computing (IC)* 20(2), March 2016, pages 72–76. doi: 10.1109/MIC.2016.30.
Selected for inclusion in IEEE Computer Society’s ComputingEdge, August 2016 issue on *Social Networking*.
- [435] Pradeep K. Murukannaiah and Munindar P. Singh. “Understanding Location-Based User Experience.” *IEEE Internet Computing (IC)* 18(6), November 2014, pages 72–76. doi: 10.1109/MIC.2014.127.
- [436] Mona Singh and Munindar P. Singh. “Augmented Reality Interfaces.” *IEEE Internet Computing (IC)* 17(6), November 2013, pages 66–70. doi: 10.1109/MIC.2013.107.

Being Interactive The following are articles from this bimonthly column, which I wrote while serving as the editor-in-chief of *IEEE Internet Computing* (from January 1999 to December 2002).

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- [442] Munindar P. Singh. “Privacy for Telecom Services.” *IEEE Internet Computing (IC)* 6(1), January 2002. Instance of the column *Being Interactive*, pages 4–5. doi: 10.1109/MIC.2002.978364.
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- [445] Munindar P. Singh. “The Invisible Wireless Web.” *IEEE Internet Computing (IC)* 5(4), July 2001. Instance of the column *Being Interactive*, pages 6–7. doi: 10.1109/MIC.2001.939445.
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Agents on the Web The following are articles of this bimonthly column, which I coauthored with Michael N. Huhns from 1997 to 1998.

- [461] Michael N. Huhns and Munindar P. Singh. “Cognitive Agents.” *IEEE Internet Computing (IC)* 2(6), November 1998. Instance of the column *Agents on the Web*, pages 87–89. doi: 10.1109/4236.735992.
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3.11 Invited Forewords

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- [473] Munindar P. Singh. “Coordination and the Internet.” *Coordination of Internet Agents: Models, Technologies, and Applications*. Edited by Andrea Omicini, Franco Zambonelli, Matthias Klusch, and Robert Tolksdorf. Foreword. Berlin: Springer, 2001, pages V–VII. doi: 10.1007/978-3-662-04401-8.

3.12 Book Reviews

- [474] Munindar P. Singh. “Book review of Michael Schroeder, *Autonomous, Model-Based Diagnosis Agents*.” *ACM Computing Reviews* 39, December 1998.
- [475] Munindar P. Singh. “Agents Misunderstood.” *IEEE Spectrum* 33(2), February 1996. Book review of Peter Wayner, *Agents Unleashed*, Academic Press, 1995, pages 10, 12. doi: 10.1109/MSPEC.1996.482270.
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3.13 Editorials

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- [485] Vinton G. Cerf and Munindar P. Singh. “Internet Predictions.” *IEEE Internet Computing (IC)* 14(1), January 2010. Guest editorial, pages 10–11. DOI: 10.1109/MIC.2010.11.
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- [489] Anupam Joshi and Munindar P. Singh. “Multiagent Systems on the Net.” *Communications of the ACM (CACM)* 42(3), March 1999. Guest editorial, pages 38–40. DOI: 10.1145/295685.295695.

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3.14 Miscellaneous External Publications

These are position statements, short encyclopedia articles, and such.

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- [495] Nirav Ajmeri, Pradeep K. Murukannaiah, and Munindar P. Singh. “Ethics in Self-* Sociotechnical Systems: (Tutorial Abstract).” *Proceedings of the International IEEE Conference on Autonomic Computing and Self-Organizing Systems (ACSOS), Companion Volume*. Washington, DC: IEEE, August 2020, page 249. doi: 10.1109/ACSOS-C51401.2020.00070.
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- [497] Ricard López Fogués, Pradeep K. Murukannaiah, Jose M. Such, Agustin Espinosa, Ana Garcia-Fornes, and Munindar P. Singh. “Argumentation for Multi-Party Privacy Management.” *Proceedings of the 2nd International Workshop on Agents and CyberSecurity (ACySE)*. Position Paper. Istanbul: Not formally published, May 2015, pages 3–6. URL: <https://core.ac.uk/display/42414741>.
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- [500] Sven Koenig, Sarit Kraus, Munindar P. Singh, and Michael Wooldridge. “Report on the Fourth International Joint Conference on Autonomous Agents and Multiagent Systems.” *AI Magazine* 27(1), 2006, pages 103–107. doi: 10.1609/aimag.v27i1.1870.

- [501] Michael N. Huhns, Munindar P. Singh, Mark H. Burstein, Keith S. Decker, Edmund H. Durfee, Timothy W. Finin, Les Gasser, Hrishikesh J. Goradia, Nicholas R. Jennings, Kiran Lakkaraju, Hideyuki Nakashima, H. Van Dyke Parunak, Jeffrey S. Rosenschein, Alicia Ruvinsky, Gita Sukthankar, Samarth Swarup, Katia P. Sycara, Milind Tambe, Thomas Wagner, and Rosa Laura Zavala Gutierrez. “Research Directions for Service-Oriented Multiagent Systems.” *IEEE Internet Computing (IC)* 9(6), November 2005, pages 65–70. doi: 10.1109/MIC.2005.132.
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- [509] Munindar P. Singh. *Principles of Standardization. Foundation of Intelligent Physical Agents (FIPA)*, Palo Alto, position statement. January 1998.
- [510] Munindar P. Singh. “Interaction-Oriented Programming for the Web.” *Proceedings of the 2nd IF-CIS International Conference on Cooperative Information Systems (CoopIS)*. My statement appears as page 75 of a writeup appearing under the name of the panel organizer, doi: 10.1109/COOPIS.1997.613804. Kiawah Island, South Carolina, June 1997.

3.15 Tutorial Notes

I list only the latest of the major variants of my tutorial notes, which I hand out to tutorial attendees. These are sometimes cited in the literature.

- [511] (Amit K. Chopra and Munindar P. Singh), “Programming for Autonomy.” Tutorial notes. June 2020.
- [512] (Pradeep K. Murukannaiah, Nirav Ajmeri, and Munindar P. Singh), “Ethics in Sociotechnical Systems.” Tutorial notes. May 2020.

- [513] (Amit K. Chopra and Munindar P. Singh), “Engineering Distributed Systems via Protocols and Commitments.” Tutorial notes. January 2019.
- [514] (Munindar P. Singh and Amit K. Chopra), “The Internet of Things and Multiagent Systems.” Tutorial notes. July 2015, July 2016.
- [515] (Amit K. Chopra and Munindar P. Singh), “Decentralized Multiagent Systems.” Tutorial notes. March 2015.
- [516] (Amit K. Chopra and Munindar P. Singh), “Commitments in Software Engineering.” Tutorial notes. May 2013.
- [517] (Munindar P. Singh and Nirmit Desai), “Multidisciplinary Views of Business Contracts.” Tutorial notes. December 2010.
- [518] (Munindar P. Singh and Michael N. Huhns) “Fundamentals of Web Services.” Tutorial notes. 2002.
- [519] (Munindar P. Singh and Michael N. Huhns) “Service Composition Techniques.” Tutorial notes. 2002.
- [520] (Munindar P. Singh and Michael N. Huhns) “Agent Technology and Electronic Commerce.” Tutorial notes. 1999.
- [521] (Munindar P. Singh and Michael N. Huhns) “Principles of Agents and Multiagent Systems: Social, Ethical, and Legal Abstractions and Reasoning.” Tutorial notes. 1999.
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- [523] (Michael N. Huhns and Munindar P. Singh) “Cooperative Information Systems.” Tutorial notes. 1994–1996.

3.16 Invited Conference and Workshop Presentations

1. “Consent as a Foundation for Responsible Autonomy.” *International Workshop on Coordination, Organizations, Institutions, Norms and Ethics for Governance of Multi-Agent Systems (COINE)*, Online, May 2022.
2. “Interaction-Oriented Programming for Decentralized Service Engagements.” *Twenty-second International Conference on Web Information Systems Engineering (WISE)*, Melbourne, October 2021.
3. “Deserv: Decentralized Serverless Computing.” *Nineteenth IEEE International Conference on Web Services (ICWS)*, Online, September 2021.
4. “Socially Intelligent Infrastructure: Vision and Challenges in a Sociotechnical Systems Perspective.” *South Big Data Hub’s All Hands Meeting*, University of Virginia, Charlottesville (virtually), July 2021.
5. “Autonomous Agents and Ethical Multiagent Systems.” *Nineteenth International Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, Auckland (virtually), May 2020.
6. “Engineering Ethical Multiagent Systems.” *International Workshop on Engineering Multiagent Systems (EMAS)*, Montréal, May 2019.

7. "Security, Privacy, and Accountability: Foundations in Sociotechnical Systems." Joint session of *International Workshop on Engineering Multiagent Systems (EMAS)* and *International Workshop on Coordination, Organization, Institutions and Norms in Agent Systems (COIN)*, Singapore, May 2016.
8. "NoBPM: Supporting Interaction-Oriented Automation via Normative Specifications of Processes." *Thirteenth International Conference on Business Process Management (BPM)*, Innsbruck, Austria, September 2015.
9. "Accountability as a Foundation for Requirements in Sociotechnical Systems." *International Workshop on Coordination, Organization, Institutions and Norms in Agent Systems (COIN)*, Buenos Aires, July 2015.
10. "Toward New Foundations for Computational Trust." *CROSSING: Where Quantum Physics, Cryptography, System Security and Software Engineering Meet*, Darmstadt, Germany, June 2015.
11. "Toward a Science of Security (and Governance) in Service Systems." *IEEE Services and Big Data Congress*, which combines IEEE Conferences on *Cloud Computing*, *Big Data*, *Mobile Services*, *Service Computing*, and *Web Services*, Anchorage, June 2014.
12. "Honest-to-Goodness Social Computing: Challenges and Opportunities for Multiagent Systems." *First International Workshop on Multiagent Foundations of Social Computing (MFSC)*, Paris, May 2014.
13. "The Science of Security: Introduction from the Perspective of Secure Collaboration." *First International Workshop on Agents and CyberSecurity (ACySe)*, Paris, May 2014.
14. "Trust and Emotions." *Seventeenth International Workshop on Trust in Agent Societies*, Paris, May 2014.
15. "Honest-to-Goodness Social Computing: Critique of Current Research and a Call to Arms." *Joint Session of Dagstuhl Seminars on Crowdsourcing and Cloud Services*, Wadern, Germany, September 2013.
16. "Bringing Commitments and Other Norms to Practice." *Invitational Workshop on Norms and Multiagent Systems (NorMAS)*, Leiden, The Netherlands, August 2013.
17. "Can't We All Just Get Along? Agreement Technologies and the Science of Security." *International Conference on Agreement Technologies (AT)*, Beijing, August 2013.
18. "Governing Sociotechnical Systems: Combining Norms and Policies." *Thirteenth IEEE International Symposium on Policies for Distributed Systems and Networks (POLICY)*, Chapel Hill, July 2012.
19. "Governing Sociotechnical Systems." Joint Session of the *International Conferences on Web Intelligence and Intelligent Agent Technologies*, Lyon, August 2011.
20. "Governing Sociotechnical Systems." *Fifth International iStar Workshop*, Trento, Italy, August 2011.
21. "Trust as a Basis for Social Computing." *RE Workshop on Requirements Engineering for Social Computing*, Trento, Italy, August 2011.
22. "Institutions as a Basis for Service Engagements." *AAMAS Workshop on Agent-Oriented Software Engineering (AOSE)*, Taipei, May 2011.

23. "Understanding Identity as a Social Construct: Preliminary Thoughts." *International Conference on Service-Oriented Computing (ICSOC)*, San Francisco, December 2010.
24. "Understanding Identity: Preliminary Thoughts." *Thirteenth International Workshop on Trust in Agent Societies*, Toronto, May 2010.
25. "Programming MAS without Programming Agents." *Seventh International Workshop on Programming Multi-Agent Systems (ProMAS)*, Budapest, May 2009.
26. "Interaction-Oriented Programming: Commitments and Protocols for Business Processes." Invited lecture at *MALLOW: Multi-Agent Logics, Languages, and Organisations—Federated Workshops*, Durham, UK, September 2007.
27. "Commitment-Based SOA." Invited lecture at *Workshop on Agents, Web Services and Ontologies: Integrated Methodologies (Awesome)*, Durham, UK, September 2007.
28. "P2P and Service-Oriented Architectures." *International Workshop on Agents and Peer-to-Peer Computation*, Hawaii, May 2007.
29. "Agent Organizations and Service-Oriented Computing." *International Workshop on Coordination, Organization, Institutions and Norms in Agent Systems (COIN)*, Hawaii, May 2007.
30. "Service-Oriented Computing Roundtable." *International Workshop on Coordination, Organization, Institutions and Norms in Agent Systems (COIN)*, Hawaii, May 2007.
31. "Interaction-Oriented Programming for Organizational Computing." Invited panel presentation in a panel on "Organizational Computing." *Sixth International Joint Conference on Autonomous Agents and MultiAgent Systems (AAMAS)*, Hawaii, May 2007.
32. "Interaction-Oriented Programming: Concepts, Theories, and Results on Commitment Protocols." Keynote lecture at *Australian Artificial Intelligence Conference (AI)*, Hobart, Tasmania, December 2006.
33. "Governance of Cyberinfrastructure: Motivation, Concepts, Approach, Call to Arms." Keynote lecture at *Workshop on Service Oriented Computing for e-Science*, Toronto, October 2006.
34. "Agents to Bridge the Business-IT Divide." Invited presentation in a panel on "Will Agent-Orientation Reshape IS Theory and Practice?" *International Workshop on Agent-Oriented Information Systems (AOIS)*, Hakodate, Japan, May 2006.
35. "Business Process Adaptations via Protocols." *International Workshop on Agent-Oriented Information Systems (AOIS)*, Hakodate, Japan, May 2006.
36. "An Overview of Commitment Facets and Visibility for Interorganizational Processes." *First International Workshop on Coordination of Inter-Organizational Workflows: Agent and Semantic Web Based Models (CIOW)*, Hakodate, Japan, May 2006.
37. "Understanding Policies in Commitment Protocols." *International Workshop on Declarative Agent Languages and Technologies (DALT)*, Hakodate, Japan, May 2006.
38. "From Protocols to Processes." *International Workshop on Agent-Oriented Information Systems (AOIS)*, New York, July 2004.

39. "From Protocols to Processes." *Web Services and Agent-Based Engineering*, New York, July 2004, Keynote lecture.
40. "A Pragmatics Perspective on Web Services." Joint panel session of the workshops on *Challenges in Open Agent Systems*, *Ontologies in Agent Systems*, and *Web Services and Agent-Based Engineering*, July 2003.
41. "Referrals for Reputation." *First Interdisciplinary Symposium on Online Reputation Mechanisms*, Cambridge, Massachusetts, April 2003. Sponsored by the National Science Foundation and the MIT Center for e-Business.
42. (Munindar P. Singh and Pinar Yolum) "Trust Roundtable." *International Workshop on Agents and Peer-to-Peer Computation*, Bologna, July 2002.
43. "A Model for P2P Computation." *International Workshop on Agents and Peer-to-Peer Computation*, Bologna, July 2002.
44. "The Pragmatic Web: Preliminary Thoughts." *NSF-OntoWeb Workshop on Database and Information Systems Research for Semantic Web and Enterprises*, Amicalola Falls State Park, Georgia, April 2002.
45. (Pinar Yolum and Munindar P. Singh) "Commitment Machines." *International Workshop on Agent-Oriented Information Systems (AOIS)*, Montréal, June 2001.
46. "Agents and Multiagent Systems: Concepts and Directions." *Fifth International Congress on Computer Science Research*, Aguascalientes, Mexico, November 1998. Sponsored by the Mexican National Academy of Computer Science Research.
47. "The Dialectic of Practical Reasoning." *ECAI Workshop on Practical Reasoning*, Brighton, August 1998.
48. "Agent Mobility Considered Harmful." Invited presentation in a panel on "The Future of Adaptive and Mobile Information Agents-Travelling Bandits on the Information Highway, or Powerful Information Providers?" *Second International Workshop on Cooperative Information Agents (CIA)*, Paris, July 1998.
49. "A Social View of Rationality." Invited presentation in a panel on "Is Rationality an Objective or a Subjective Notion?" *ECAI Workshop on Practical Representation and Reasoning*, Brighton, August 1998.
50. "Challenges in Empirical Studies of Multiagent Systems." Invited presentation in a panel on "Design of Computational Experiments." *ECAI Workshop on Empirical Artificial Intelligence*, Brighton, August 1998.
51. "The Dialectic of Science: Interaction-Oriented Programming Applied." *Third NSF-CONACyT Computer Science Workshop*, Universidad de las Americas, Puebla, Mexico, June 1998.
52. "Multiagent Systems in Information-Rich Environments." *Second International Workshop on Cooperative Information Agents (CIA)*, Paris, July 1998. Invited talk.
53. "Conceptual Modeling for Multiagent Systems." *ER-97 Symposium on Conceptual Modeling: Historical Perspectives and Future Directions*, Los Angeles, November 1997. Invited talk.

54. “Challenges for Mobile Agents.” *Workshop of Mobile Agents and Security (MAAS)*, Maryland Center for Telecommunications Research, University of Maryland Baltimore County, Baltimore, October 1997. Invited talk.
55. “Business Applications of Multiagent Systems.” *IJCAI Workshop on Business Applications of Artificial Intelligence*, Nagoya, Japan, August 1997. Invited talk.
56. “Interaction-Oriented Programming for the Web.” Invited presentation in a panel on “Cooperative Multiagent Systems for the Web.” *Second IFCIS International Conference on Cooperative Information Systems (CoopIS)*, Charleston, June 1997.
57. “Challenges to Machine Learning in Cooperative Information Systems.” *ECAI Workshop on Learning in Distributed Artificial Intelligence Systems*, Budapest, August 1996. Invited talk.
58. *International Conference on Multiagent Systems (ICMAS) Workshop on Norms, Obligations, and Conventions*, Kyoto, December 1996. Invited panel presentation.
59. “Commitments in Multiagent Systems.” *International Conference on Multiagent Systems (ICMAS)*, San Francisco, June 1995. Invited panel presentation.

3.17 Other Invited Presentations

1. (with students Zhen Guo and Shrey Anand) “Understanding and Supporting Analytics.” InfoSys, Durham, December 2018.
2. “Honest-to-Goodness Social Computing: Challenges and Opportunities for Multiagent Systems.” Technical University of Delft, Delft, The Netherlands, February 2015.
3. “The Science of Security: Introduction from the Perspective of Secure Collaboration.” Technical University of Delft, Delft, The Netherlands, February 2015.
4. “The Science of Security: Ensuring Secure Collaboration.” Keynote at Annual Research Review, University of Georgia, Athens, April 2014.
5. “The Science of Security: Introduction from the Perspective of Secure Collaboration.” University of Lancaster, Lancaster, UK, February 2014.
6. “Trust (and Commitments) as a Unifying Basis for Social Computing.” INRIA Roquencourt, Paris, August 2013.
7. “Understanding Service Engagements.” Xerox Research Center, Webster, New York, February 2013.
8. “Governing Sociotechnical Systems.” Presentation at the University of Wollongong, Australia, May 2012.
9. “Governing Sociotechnical Systems.” Presentation at the University of Trento, Trento, Italy, April 2012.
10. “LoST: Local State Transfer—An Architectural Style for the Distributed Enactment of Business Protocols.” Presentation at University of Trento, Trento, Italy, April 2012.
11. “LoST: Local State Transfer—An Architectural Style for the Distributed Enactment of Business Protocols.” Presentation at Rochester Institute of Technology, Rochester, New York, October 2012.

12. "Modeling and Analyzing Contracts." Hewlett-Packard Research Laboratories, Palo Alto, March 2010.
13. "Trust as a Unifying Basis for Social Computing." *Interdisciplinary Workshop on Trust*, Paris, December 2010.
14. "Trust as a Basis for Social Computing." *ARO Workshop on Social Computing*, College Park, Maryland, July 2010.
15. "Trust and Reputation in Multiagent Systems: Rational Agents and Dynamics." ARL Network Science Collaborative Technology Alliance Kick Off Meeting, Cambridge, Massachusetts, June 2010.
16. "Community Standards for Agent Communication: A Manifesto." *AAMAS Workshop on Agent Communication*, Toronto, May 2010.
17. "Trust and Reputation in Multiagent Systems: Rational Agents and Dynamics." University of Luxembourg, Luxembourg, April 2010.
18. "Governing Cross-Organizational Service Agreements: A Policy-Based Approach." Invited lecture at *Southampton University*, Southampton, UK, September 2007.
19. "Putting Services Back in Service Orientation: Commitments in Architecture and Governance." Invited lecture at *ChannelAdvisor Inc.*, Morrisville, North Carolina, June 2007.
20. "Interaction-Oriented Programming: Concepts, Theories, and Results on Commitment Protocols." Invited lecture at *IBM TJ Watson Research Laboratory*, Hawthorne, New York, November 2006.
21. "Referral Systems: Applications in Knowledge Management and Emergent Properties." Invited lecture at *Université de Montréal*, Montréal, November 2006.
22. "Referral Systems: Formulation and Emergent Properties." University of Otago, Dunedin, New Zealand, July 2006.
23. "Referral Systems: Formulation and Emergent Properties." Hewlett-Packard Research Laboratories, Palo Alto, March 2006.
24. "Commitments for Business Processes: Overview of Concepts, Protocols, Machines, Compliance." Hewlett-Packard Research Laboratories, Palo Alto, August 2002.
25. "Agents Meet Databases: Steps Toward Interaction-Oriented Programming." Presentation at the Department of Mathematical Sciences, University of North Carolina, Greensboro, April 1998.
26. "Agents Meet Databases: Introduction to Interaction-Oriented Programming." Presentation at the Center for Advanced Computing, University of Southwestern Louisiana, Lafayette, April 1998.
27. "Principles of Standardization for Agent Communication." Presentation to the 5th Meeting of the Foundation for Intelligent Physical Agents (FIPA), Palo Alto, January 1998.
28. "Steps Toward Interaction-Oriented Programming." Presentation at the Information Sciences Institute (ISI), University of Southern California, Marina del Rey, November 1997.
29. "Interaction-Oriented Programming: Agent Technology for Virtual Enterprises and Electronic Commerce." Presentation at the Center for Communication and Information Sciences (CCIS) Lecture Series on Electronic Commerce and High Performance Computing, University of Nebraska, Lincoln, October 1997.

30. “Steps Toward Interaction-Oriented Programming.” Presentation at the NTT Communication Science Laboratories, Kyoto, August 1997.
31. “Comments on Agents and Workflows.” Presentation at IBM, RTP, North Carolina, June 1997.
32. “Considerations on Agent Communication.” Presentation to the 5th Meeting of the Foundation for Intelligent Physical Agents (FIPA), Reston, Virginia, April 1997.
33. “Agent Techniques for Open Information Environments.” Presentation in the Triangle Public Lectures Series. SAS Institute, Cary, North Carolina, February 1996.
34. International Computer Science Institute (ICSI), Berkeley, California, November 1991.
35. University of Erlangen, Nuremberg, Germany, August 1991.
36. German Research Center for Artificial Intelligence (DFKI), Kaiserslautern, Germany, July 1991.
37. German Research Center for Artificial Intelligence (DFKI), Saarbrücken, Germany, July 1991.

3.18 Impact of Scholarly Contributions

Invitations to Prestigious Events

- NSF “Beyond the Internet” workshop on Software Defined Infrastructure and Software Defined Exchanges, February 2016.
- Microsoft Research’s SemGrail Workshop, June 2007.
- Google Faculty Summit, July 2007.
- Microsoft Faculty Summit, July 2005, 2006 (declined), 2007, 2011 (declined), 2012 (declined).
- NSF IIS/GENI Workshop, November 2006.
- NSF-OntoWeb Workshop on Database and Information Systems Research for Semantic Web and Enterprises, April 2002.
- NSF Workshop on Workflow and Process Automation in Information Systems: State-of-the-art and Future Directions, April 1996.

Inclusion in Collection The following book consists of reprints of three “crucial” papers and several new contributed chapters. My paper [98] is one of the three reprinted papers.

- Marc-Philippe Huget, editor, *Communication in Multiagent Systems*, Lecture Notes in Artificial Intelligence 2650, Springer-Verlag, Berlin, 2003.

Reviews These are published reviews of my works.

1. José M. Vidal, “Review of Gerhard Weiß (editor), *Multiagent Systems: A Modern Approach to Distributed Artificial Intelligence*.” *Autonomous Agents and Multi-Agent Systems*, volume 2, number 4, December 1999, pages 403–408. I contributed a chapter [375] to the reviewed book; this chapter is discussed on page 407 of the review.

2. Jeff White, “Review of Readings in Agents” (my book [3]). *Journal of the American Society for Information Science*, 49(14):1330–1332, December 1998.
3. Hyacinth S. Nwana, “Review of Readings in Agents” (my book [3]). *Journal of Logic and Computation*, 8(3):448–450, June 1998.

4 Patents

In 2017, Facebook acquired a company that had acquired my startup, Ektimisi Semiotics. The main part of the acquisition was a portfolio of 35 patents of which I am the sole or lead inventor. This information is available in an industry report from the business intelligence firm, Relecura (see https://relecura.com/wp-content/uploads/2017/12/Facebook_Relecura_Report_20171221.pdf, Table “Key Acquisitions” on Page 5.)

The following patents demonstrate practical applications of agents and policies and concerning middle-ware for location and context to enable intelligent mobile apps.

1. Munindar P. Singh and Mona Singh. “System and Method for Identifying a Location of Interest to be Named by a User.” US Patent #10,200,821. Awarded February 2019.
2. Munindar P. Singh and Mona Singh. “Method, System, and Computer Program Product for Delivering Smart Services.” US Patent #10,154,099. Awarded December 2018.
3. Munindar P. Singh and Mona Singh. “System and Method for Providing a Descriptor for a Location to a Recipient.” US Patent #9,992,629. Awarded June 2018.
4. Munindar P. Singh and Mona Singh. “Apparatus and method for Providing a Task Reminder based on User Location.” US Patent #9,990,833. Awarded June 2018.
5. Munindar P. Singh and Mona Singh. “System and Method for Naming a Location Based on User-Specific Information.” US Patent #9,846,045. Awarded December 2017.
6. Munindar P. Singh and Mona Singh. “System and Method for Identifying a Location of Interest to be Named by a User.” US Patent #9,635,511. Awarded April 2017.
7. Munindar P. Singh and Mona Singh. “System and Method for Providing a Descriptor for a Location to a Recipient.” US Patent #9,538,324. Awarded January 2017.
8. Munindar P. Singh and Mona Singh. “Apparatus and Method for Providing a Task Reminder based on User Location.” US Patent #9,449,489. Awarded September 2016.
9. Munindar P. Singh and Mona Singh. “Method and Apparatus for Providing a Contextual Description of an Object.” US Patent #9,396,185. Awarded July 2016.
10. Munindar P. Singh. “Automatic Generation of Metadata for a Digital Image based on Meteorological Conditions.” US Patent #9,342,534. Awarded May 2016.
11. Munindar P. Singh and Mona Singh. “System and Method for Naming a Location based on User-Specific Information.” US Patent #9,338,240. Awarded May 2016.
12. Munindar P. Singh and Mona Singh. “System and Method for Providing Notification of a Task.” US Patent #9,189,947. Awarded November 2015.
13. Munindar P. Singh and Mona Singh. “System and Method for Providing a Descriptor for a Location to a Recipient.” US Patent #9,055,109. Awarded June 2015.
14. Munindar P. Singh and Mona Singh. “System and Method for Identifying a Location of Interest to be Named by a User.” US Patent #8,935,244. Awarded January 2015.
15. Munindar P. Singh. “Automatic Generation of Metadata for a Digital Image Based on Ambient Conditions.” US Patent #8,842,197. Awarded September 2014.

16. Munindar P. Singh and Mona Singh. "System and Method for Naming a Location Based on User-Specific Information." US Patent #8,750,892. Awarded June 2014.
17. Munindar P. Singh and Mona Singh. "Methods, Systems, and Computer Program Products for Role- and Locale-Based Mobile User Device Feature Control." US Patent #8,738,029. Awarded May 2014.
18. Munindar P. Singh and Mona Singh. "System and Method for Providing a Descriptor for a Location to a Recipient." US Patent #8,737,969. Awarded May 2014.
19. Munindar P. Singh and Mona Singh. "Policy Based Controls for Wireless Cameras." US Patent #8,660,534. Awarded February 2014.
20. Munindar P. Singh and Mona Singh. "Apparatus and Method for Providing a Task Reminder based on Travel History." US Patent #8,648,715. Awarded February 2014.
21. Munindar P. Singh and Mona Singh. "System and Method for Providing a Task Reminder." US Patent #8,614,628. Awarded December 2013.
22. Munindar P. Singh and Mona Singh. "Method, System, and Computer Program Product for Delivering Smart Services." US Patent #8,611,870. Awarded December 2013.
23. Munindar P. Singh and Mona Singh. "System and Method for Identifying a Location of Interest to be Named by a User." US Patent #8,554,765. Awarded October 2013.
24. Munindar P. Singh and Mona Singh. "System and Method for Providing a Task Reminder." US Patent #8,471,696. Awarded June 2013.
25. Munindar P. Singh and Mona Singh. "System and Method for Identifying a Location of Interest to be Named by a User." US Patent #8,407,213. Awarded March 2013.
26. Munindar P. Singh and Mona Singh. "Apparatus and Method for Providing a Task Reminder based on Travel History." US Patent #8,400,293. Awarded March 2013.
27. Munindar P. Singh and Mona Singh. "Method, System, and Computer Program Product for Creating Smart Services." US Patent #8,311,525. Awarded November 2012.
28. Munindar P. Singh and Mona Singh. "Policy-Based Controls for Wireless Cameras." US Patent #8,238,879. Awarded August 2012.
29. Munindar P. Singh and Mona Singh. "System and Method for Providing a Task Reminder." US Patent #8,188,856. Awarded May 2012.
30. Munindar P. Singh and Mona Singh. "Method, System, and Computer Program Product for Delivering Smart Services." US Patent #8,145,581. Awarded March 2012.
31. Munindar P. Singh and Mona Singh. "Methods, Systems, and Computer Program Products for Role- and Locale-Based Mobile User Device Feature Control." US Patent #8,145,241. Awarded March 2012.
32. Munindar P. Singh and Mona Singh. "Apparatus and Method for Providing a Task Reminder based on Travel History." US Patent #8,138,912. Awarded March 2012.

33. Munindar P. Singh and Mona Singh. "System and Method for Providing a Descriptor for a Location to a Recipient." US Patent #8,099,086. Awarded January 2012.
34. Munindar P. Singh and Mona Singh. "Method, System, and Computer Program Product for Creating Smart Services." US Patent #8,099,084. Awarded January 2012.
35. Munindar P. Singh and Mona Singh. "Method, System, and Computer Program Product for Adaptively Learning User Preferences for Smart Services." US Patent #8,041,658. Awarded October 2011.
36. Munindar P. Singh and Mona Singh. "System and Method for Providing a Task Reminder based on Historical Travel Information." US Patent #7,999,669. Awarded August 2011.
37. Munindar P. Singh and Mona Singh. "Method, System, and Computer Program Product for Delivering Smart Services." US Patent #7,991,711. Awarded August 2011.
38. Munindar P. Singh and Mona Singh. "Policy-Based Controls for Wireless Cameras." US Patent #7,869,790. Awarded January 2011.
39. Munindar P. Singh and Mona Singh. "Method, System, and Computer Program Product for Delivering Smart Services." US Patent #7,765,173. Awarded July 2010.
40. Munindar P. Singh and Mona Singh. "System and Method for Providing a Task Reminder Based on Historical Travel Information." US Patent #7,649,454. Awarded January 2010.
41. Munindar P. Singh and Mona Singh. "Method, System, and Computer Program Product for Adaptively Learning User Preferences for Smart Services." US Patent #7,647,283. Awarded January 2010.
42. Munindar P. Singh and Mona Singh. "Methods, Systems, and Computer Program Products for Presenting Topical Information Referenced during a Communication." "US Patent #7,606,856. Awarded October 2009.
43. Munindar P. Singh and Mona Singh. "Apparatus and Method for Providing a Task Reminder Based on Travel History." US Patent #7,528,713. Awarded May 2009.
44. Munindar P. Singh and Billy G. Moon. "Stored Data Object Management and Archive Control." US Patent #6,490,597. Awarded December 2002.
45. Munindar P. Singh. "Lazy Updates of Profiles in a System of Communication Devices." US Patent #6,298,228. Awarded October 2001.

5 Research Sponsorship

Tables 1, 2, and 3 summarize my funding record to help see how much of my funding is external and how much would be my prorated share for grants with multiple investigators.

Table 1: Funding by type.

| External cash | External equipment | Internal cash | Total |
|--------------------------|-------------------------------|--------------------------|--------------|
| \$19,940,133 | \$26,500 | \$148,272 | \$20,114,905 |

Table 2: Funding by role.

| Role | Amount |
|------------------------------|---------------|
| As principal investigator | \$8,149,778 |
| As co-principal investigator | \$11,965,127 |
| Total | \$20,114,905 |

Table 3: Prorated share of funding.

| | Aggregate | Prorated share |
|-------------------------------|------------------|-----------------------|
| As sole investigator | \$6,943,345 | \$6,943,345 |
| As one of two investigators | \$10,535,076 | \$5,267,538 |
| As one of three investigators | \$430,310 | \$143,437 |
| As one of four investigators | \$2,056,174 | \$514,044 |
| As one of five investigators | \$150,000 | \$30,000 |
| Totals | \$20,114,905 | \$12,898,364 |

5.1 Ongoing Research Activities

1. (sole PI) “RI: Small: Foundations of Ethics for Multiagent Systems.” National Science Foundation. Funded October 2021–September 2024 for \$500,000.
2. (co-PI with Dr. Julie S. Ivy of ISE) “SCC: Serving Households in AREas with food Insecurity with a Network for Good: SHARING.” National Science Foundation. Funded October 2021–September 2025 for \$2,018,000.
3. (co-PI with Dr. Eleni Bardaka of CCEE) “SCC-PG: Empathy and AI: Towards Equitable Microtransit.” National Science Foundation. Funded October 2021–September 2022 for \$150,000.

4. (co-PI with Dr. Laurie Williams) “Science of Security Lablet: Impact Through Research, Scientific Methods, and Community Development.” National Security Agency. Funded January 2021–March 2023 for \$836,477. Continuation.
5. (sole PI) “Achieving Resilience Against Cyber Threats in IT/OT Networks via Defensive Deception.” Texas Engineering Experiment Station (Texas A&M). Funded January 2021–December 2021 for \$225,000.
6. (sole PI) “Odbody: An Ethics and Privacy Guardian Angel for Social Media Users.” Award under the RFP *Agent-based User Interaction Simulation to Find and Fix Integrity and Privacy Issues*. Facebook. Funded January 2021–December 2021 for \$54,800.
7. (sole PI) “Cyber Defensive Deception based on Hypergame Theory for Tactical Networks.” Army Research Office. Funded December 2020–April 2023 for \$95,000.
8. (sole PI) “Understanding the Emotional Impact of COVID-19 Coverage in Popular Media, and its Implications.” University Global Partnership Network (UGPN). Funded July 2020–June 2021 for \$10,000.
9. (sole PI) “RI: Small: Principles of Normative Multiagent Systems for Decentralized Applications.” National Science Foundation. Funded October 2019–September 2023 for \$450,000.
10. (sole PI) “Realizing Cyber Inception: Toward a Science of Personalized Deception for Cyber Defense.” Army Research Office. Funded June 2017–May 2022 for \$618,720.

5.2 Past Research Activities

1. (co-PI with Dr. Laurie Williams) “Science of Security Lablet: Impact Through Research, Scientific Methods, and Community Development.” National Security Agency. Funded January 2020–January 2021 for \$847,601. Continuation.
2. (sole PI) “Data Access and Governance over a Shared Ledger.” Center of Hybrid Multicore Productivity Research (CHMPR)–NCSU Research Site. Funded January 2020–June 2020 for \$37,149.
3. (sole PI) “Human-Machine Collaboration: Adaptive Declarative Workflows for Analytic Computing and Text Analytics.” National Security Agency through the Laboratory for Analytic Sciences. Funded January 2020–December 2020 for \$107,154.
4. (sole PI) “Artificial Intelligence for Sustainable Project Management.” University Global Partnership Network (UGPN). Funded July 2019–June 2020 for \$9,999.
5. (co-PI with Veljko Dubljević, William A. Bauer, George F. List) “Sociotechnical Principles for Computational Ethics of AV Systems and Other AI Technologies.” NC State’s Research and Innovation Seed Funding (RISF). Funded July 2019–June 2020 for \$38,174.
6. (sole PI) “Human-Machine Collaboration: Adaptive Declarative Workflows for Analytic Computing and Text Analytics.” National Security Agency through the Laboratory for Analytic Sciences. Funded January 2019–December 2019 for \$103,252.
7. (co-PI with Dr. Laurie Williams) “Science of Security Lablet: Impact Through Research, Scientific Methods, and Community Development.” National Security Agency. Funded January 2019–January 2020 for \$875,544. Continuation.

8. (sole PI) “Blockchain for Streamlining Multiparty Approval Processes and Infrastructure Support Engagement.” Shared University Research project. IBM. Funded November 2018–December 2019 for \$75,000.
9. (co-PI with Dr. Laurie Williams) “Science of Security Lablet: Impact Through Research, Scientific Methods, and Community Development.” National Security Agency. Funded January 2018–January 2019 for \$467,750.
10. (sole PI) “Creativity in Cybersecurity Analysis; and Adaptive Declarative Workflows for Analytic Computing.” National Security Agency through the Laboratory for Analytic Sciences. Funded January 2018–December 2018 for \$161,784.
11. (sole PI) “Analytic Component System.” National Security Agency through the Laboratory for Analytic Sciences. Funded January 2017–December 2017 for \$97,257.
12. (sole PI) “Contracts in Blockchains: Abstractions and Techniques.” IBM. Funded November 2016–December 2017 for \$30,000.
13. (sole PI) “User Experience (Tools for Intelligence Analytics).” National Security Agency through the Laboratory for Analytic Sciences. Funded January 2016–December 2016 for \$96,341.
14. (co-PI with Dr. Laurie Williams) “Growing the Science of Security through Analytics.” National Security Agency. Funded March 2016–March 2017 for \$2,207,905. Continuation.
15. (sole PI) “Informatics for Analytics.” National Security Agency through the Laboratory for Analytic Sciences. Funded April 2015–December 2015 for \$128,002.
16. (co-PI with Dr. Laurie Williams) “Growing the Science of Security through Analytics.” National Security Agency. Funded March 2015–March 2016 for \$2,224,102. Continuation.
17. (sole PI) “Mission Enabling.” National Security Agency through the Laboratory for Analytic Sciences. Funded May 2014–May 2015 for \$271,901.
18. (sole PI) “Knowledge Representation and Management.” National Security Agency through the Laboratory for Analytic Sciences. Funded May 2014–May 2015 for \$80,116.
19. (sole PI) “Analytic Workflow.” National Security Agency through the Laboratory for Analytic Sciences. Funded May 2014–May 2015 for \$61,570.
20. (co-PI with Dr. Laurie Williams) “Growing the Science of Security through Analytics.” National Security Agency. Funded February 2014–March 2015 for \$2,255,237. Continuation.
21. (sole PI) “Analytic Workflow.” National Security Agency through the Laboratory for Analytic Sciences. Funded September 2013–September 2014 for \$43,889.
22. (sole PI) “Quality of Information-Aware Networks for Tactical Applications (QUANTA).” Army Research Laboratory under the Network Science Collaborative Technology Alliance. Funded October 2009–September 2014 for \$577,847.
23. (sole PI) “Policy-Based Governance for the OOI Cyberinfrastructure.” Joint Oceanographic Institutions. Funded September 2009–November 2013 for \$471,430.
24. (sole PI) “Social Media Relationship Analytics.” Whodini Inc. Funded March 2013–May 2013 for \$4,026.

25. (PI: John P. Streck) "Business Process Reengineering." NC Division of Employment Security. Funded December 2012–February 2013 for \$30,000.
26. (sole PI) "Social Computing and Community Engagements for Collaborative Service Marketplace." Xerox Corporation. Funded December 2012–November 2013 for \$55,000.
27. (sole PI) "On the Influence of Norms and Sanctions on Socio-Technical Systems Governance-An Agent-Based Simulation Approach." University Global Partnership Network (UGPN). Funded March 2013–February 2014 for \$10,000.
28. (sole PI) "Normative Trust: Toward a Principled Basis for Enabling Trustworthy Decision Making." National Security Agency. Funded May 2012–May 2013 for (NCSU's share) \$101,410.
29. (sole PI with external subcontractor) "Argumentation as a Basis for Reasoning about Security." National Security Agency. Funded May 2012–May 2015 for (NCSU's share for the first year) \$120,682.
30. (sole PI) "Social Computing and Services." Xerox Corporation. Funded October 2011–September 2012 for \$55,000.
31. (PI with Dr. Injong Rhee) "Platys: From Position to Place in Next Generation Networks." National Science Foundation under the Network Science and Engineering Program. Funded September 2009–August 2013 for \$706,167.
32. (sole PI) "Policy-Based Governance for the OOI Cyberinfrastructure." Joint Oceanographic Institutions. Funded January 2009–September 2009 for \$83,161.
33. (sole PI) "Policy-Based Governance for the OOI Cyberinfrastructure." Joint Oceanographic Institutions. Funded June 2008–December 2008 for \$44,345.
34. (sole PI) "Policy-Based Governance for Virtual Computing." Center for Advanced Computing and Communication. Funded July 2008–June 2009 for \$40,000.
35. (sole PI) "Policy-Based Governance for the OOI Cyberinfrastructure." Joint Oceanographic Institutions. Funded September 2007–May 2008 for \$63,600.
36. (sole PI) "Service-Oriented Computing in Managed IT Environments." IBM. Funded July 2007–June 2008 for \$30,000.
37. (sole PI) "Collaborative Argumentation System for Business Process Development." Intel Research Council. Funded June 2007–December 2007 for \$20,000.
38. (sole PI) "Agent-Based Conceptual Model and Policy Architecture for Virtual Organizations." Center for Advanced Computing and Communication. Funded July 2006–June 2007 for \$40,000.
39. (sole PI) "Protocols for Processes." Defense Advanced Research Projects Agency Information Exploitation Office. Funded July 2005–September 2005 for \$60,000.
40. (sole PI) "Computational Principles of Trust." National Science Foundation Information Technology Research Program. Funded September 2004–August 2006 for \$90,900.
41. (sole PI) "Computational Principles of Trust." National Science Foundation Information Technology Research Program. Research Experiences for Undergraduates supplement. Funded September 2004–May 2005 for \$6,000.

42. (sole PI) "Protocols for Processes." Defense Advanced Research Projects Agency Information Exploitation Office. Funded February 2004–December 2004 for \$160,000.
43. (PI: Mladen A. Vouk; co-PI: Munindar P. Singh) "Construction of Context-Based Services." Center for Advanced Computing and Communication. Funded July 2002–June 2003 for \$44,337.
44. (sole PI) "Principles of Commitment Protocols." National Science Foundation under the Digital Society and Technologies Program. Funded May 2002–May 2005 for \$345,000.
45. (sole PI) "Multiagent Systems for Networking and Telecommunications." Cisco University Research Grant. Funded January 2001–December 2001 for \$68,000.
46. (sole PI) "Computational Principles of Trust." National Science Foundation under the Information Technology Research Program. Funded September 2000–August 2006 for \$476,574.
47. (sole PI) "Multiagent Referral Systems for Knowledge Management." IBM Partnership Award. Funded October 2000–September 2001 for \$40,000.
48. (PI: Munindar P. Singh; co-PIs: Robert A. St. Amant and Alan L. Tharp) "Intelligent Support for On-line Shopping." O3C, Inc. Supplement to previous grant. Funded January 2000–May 2000 for \$66,789 (\$56,789 external plus \$10,000 (estimated) in cost sharing from NCSU).
49. (PI: Munindar P. Singh; co-PIs: Robert A. St. Amant and Alan L. Tharp) "Intelligent Support for On-line Shopping." Lichtin Corporation and Centennial Venture Partners. Supplement to previous grant. Funded October 1999–December 1999 for \$38,250 (\$30,000 external plus \$8,250 in cost sharing from NCSU).
50. (PI: Munindar P. Singh; co-PIs: Robert A. St. Amant and Alan L. Tharp) "Intelligent Support for On-line Shopping." Lichtin Corporation and Centennial Venture Partners. Supplement and extension to previous grant. Funded September 1999–June 2000 for \$87,613 (\$68,662 external plus \$18,951 in cost sharing from NCSU).
51. (sole PI) "Cooperative Information Systems." National Science Foundation Computational and Social Systems (CSS) program. Supplement to Career Award. Funded August 1999–July 2000 for \$21,950.
52. (PI: Munindar P. Singh; co-PIs: Robert A. St. Amant and Alan L. Tharp) "Intelligent Support for On-line Shopping." Lichtin Corporation and Centennial Venture Partners. Funded June 1999–December 1999. \$207,658 (\$169,760 external plus \$37,898 in cost sharing from NCSU).
53. (sole PI) "Multiagent Workflow Management." Rational Software Corporation. Equipment (commercial software) grant for \$11,000.
54. (sole PI) "Multiagent Systems for a Network of Mobile Communicators." Ericsson. Funded August 1998–May 1999 for a budget of \$66,424.
55. (sole PI) "Cooperative Agent-Based Systems." IBM Partnership Award. Funded October 1998–September 1999 for \$24,500 (\$20,000 cash plus equipment, whose university price is about \$4,500).
56. (sole PI) "Healthcare Enterprise Information Management: Temporal and Modal Queries." MCC (a subcontract awarded from a National Institute for Standards and Technology (NIST) contract). Funded January 1997–February 1998 for a budget of \$47,339.
57. (sole PI) "Cooperative Agent-Based Systems." IBM Partnership Award. Funded October 1997–September 1998 for \$40,000.

58. (sole PI) “Cooperative Information Systems.” National Science Foundation Information Technology and Organizations (ITO) program. Supplement to Career Award. Funded August 1996–July 1997 for \$24,959.
59. (sole PI) “Cooperative Agent-Based Systems.” IBM Partnership Award. Funded October 1996–September 1997 for \$51,000 (\$40,000 cash plus equipment, whose university price is about \$11,000).
60. (sole PI) “Cooperative Information Systems.” National Science Foundation Information Technology and Organizations (ITO) program. Funded August 1996–July 2000 for a total budget of \$214,276.
61. (sole PI) “Principles of Semantic Interoperation.” National Science Foundation Database and Expert Systems (DBES) program. Funded May 1996–May 1999 for a total budget of \$216,988.
62. (sole PI) “Information Search via Intelligent Agents.” NCSU Faculty Research and Professional Development (FRPD) Award. Funded January 1996–May 1996 for a budget of \$5,000.
63. (PI: Munindar P. Singh; co-PI: Mona Singh) “Healthcare Enterprise Information Modeling.” MCC (a subcontract awarded from a National Institute for Standards and Technology (NIST) contract). Funded December 1995–December 1996 for a budget of \$69,956.

5.3 Research Sponsorship Obtained Prior to Joining NCSU

1. “Scalable Information Management via Intelligent Mediation.” Proposal in response to ARPA Broad Area Announcement (BAA) 94-01 *Advanced Computing Systems: Intelligent Integration of Information*. Accepted, February 1994. Funded at MCC, August 1995 (effective after I left MCC).
2. “Clinical Associate Consortium (CAC).” Proposal in response to ARPA BAA 94-13 *Health Information Infrastructure*. Accepted, April 1994.
3. “Intelligent, Scalable Interoperation for NIE.” White paper in response to ARPA BAA 94-28 *National-Scale Information Enterprises (NIE)*. Accepted, July 1994. Merged with the ARPA 94-01 proposal above.
4. The Carnot Project at MCC (January 1991–December 1994) was sponsored by ATT-GIS, Bellcore, Andersen Consulting, Eastman Chemical, DoD, Motorola, ARPA, and EPA.
5. The InfoSleuth Project at MCC (January 1995–June 1997) was sponsored by Eastman Chemical, DoD, Texas Instruments, Motorola, Hughes, ARPA, and EPA.

5.3.1 Other Service

- Conducted *AI in Society* seminar series, Fall 2022–present.

6 Professional Activities

6.1 Advisory Boards of Research Projects

- *Turtles: Protocol-Based Foundations for Distributed Multiagent Systems*, Nobuko Yoshida (Imperial College London) and Amit K. Chopra (Lancaster University), Principal Investigators, 2016–present. This is a multiyear, million Pound Sterling project funded by the Engineering and Physical Sciences Research Council of UK.

- *CROSSING Collaborative Research Center on CyberSecurity*, Johannes Buchmann, Principal Investigator, Technische Universität Darmstadt, Germany (and affiliated schools), 2016–present. This is a ten-year, multimillion Euro project funded by the German Research Foundation (Deutsche Forschungsgemeinschaft DFG).
- *Lucretius: Foundations for Software Evolution*, John Mylopoulos, Principal Investigator, University of Trento, Italy, 2011–2016. This was a European Research Council “advanced” (for senior researchers) grant.
- *Liquid Publications: Scientific Publications meet the Web (LiquidPub)*, Fabio Casati, Carles Sierra, and others, Principal Investigators, 2010–2012. This was a multiinstitution, multimillion Euro project funded by the European Union.

6.2 Service on Expert Panels

- External reviewer, proposed Ph.D. program on Artificial Intelligence, University System of Georgia: 2022.
- ACM’s Heidelberg Laureate Forum Young Researcher Selection Committee: 2022, 2023.
- Member, IEEE Computer Society Fellows Evaluation Committee: 2018, 2022, 2023.
- Member, Strategy Workshop, ARO Computing Sciences Division: May 2011, November 2017.
- Member, Science Foundation Ireland’s progress review of *Lero—The Irish Software Research Centre*: May 2017.
- Member, expert panel on *Ensuring Cross-Enterprise Semantic Interoperability in Synoptic (Templated) Clinical Reporting*: 2008–2009.

This effort was sponsored by the Office of the Assistant Secretary for Planning & Evaluation (ASPE) (US Department of Health and Human Services) and the Pathology Electronic Reporting Committee of the College of American Pathologists.

6.3 Editorships and Editorial Boards

1. Editor-in-Chief, *ACM Transactions on Internet Technology (TOIT)*, December 2012–November 2018.
2. Charter Member of the Editorial Board, *Journal of Trust Management*, December 2013–December 2016. Published by Springer.
3. Member of the Editorial Board, *IEEE Transactions on Services Computing (TSC)*, September 2012–present.
4. Member of the Editorial Board, *ACM Transactions on Intelligent Systems and Technology (TIST)*, March 2012–present.
5. Member of the Editorial Board, *Journal of Artificial Intelligence Research (JAIR)*, July 2011–present. Published by the AI Access Foundation.
6. Charter Member of the Editorial Board, *Journal of Service Oriented Computing and Applications (SOCA)*, June 2006–December 2010. Published by Springer.

7. Charter Member of the Editorial Board, *International Journal of Agent-Oriented Software Engineering (IAOSE)*, March 2005–February 2011. Published from 2006 by Inderscience.
8. Charter Member of the Editorial Board, *Journal of Web Semantics: Science, Services and Agents on the World Wide Web*, October 2002–October 2010 (began publication in 2003). Published by Elsevier.
9. Editor-in-Chief, *IEEE Internet Computing*, January 1999–December 2002. Associate Editor-in-Chief, *IEEE Internet Computing*, January 1998–December 1998. Charter Member of the Editorial Board, December 1996–December 1997 (first published January 1997) and January 2003–present. URL: <http://www.computer.org/internet/>
10. Charter Member of the Editorial Board, *Journal of Autonomous Agents and Multiagent Systems*, November 1997–present (first appeared July 1998). Published by Springer.

6.4 Guest Editorships

1. (with Christie V, Samuel H., Lalana Kagal, and Alessandro Ricci) *IEEE Internet Computing*, special issue on *Decentralized Systems*, volume 26, number 6, November–December 2022.
2. (with William A. Bauer, Veljko Dubljević, George F. List, Darby Orcutt) *AI & Society: Journal of Knowledge, Culture and Communication*, special issue on *Embedding AI in Society*; submissions due in 2021, publication scheduled for 2022.
3. (with Andrei Ciortea, Xiaomin Zhu, and Calton Pu) *ACM Transactions on Internet Technology*, special issue on *Multiagent Systems and Services in the Internet of Things*; submissions due in 2021, publication scheduled for 2022.
4. (with Nadin Kökciyan, Biplav Srivastava, and Michael N. Huhns) *IEEE Internet Computing*, special issue on *Sociotechnical Perspectives on AI Ethics and Accountability*, volume 25, number 6, November–December 2021.
5. (with Pradeep K. Murukannaiah) *IEEE Internet Computing*, the *Internet Ethics: Fairness, Accountability, Transparency* department, 2020–present. This department consists of an article in every other issue that introduces new work on ethics from the standpoint of Internet applications.
6. *IEEE Internet Computing*, the *Natural Web Interfaces* department, 2013–2018. This department consists of an article in every other issue that introduces new work on emerging user interfaces.
7. (with Rino Falcone) *ACM Transactions on Intelligent Systems and Technology*, special theme on *Trust in Multiagent Systems*, volume 4, number 2, March 2013.
8. (with Vinton G. Cerf) *IEEE Internet Computing*, special theme on *Internet Predictions*, volume 14, number 1, January–February 2010, pages 10–42.
9. (with Matei Ripeanu and Sudharshan Vazhkudai) *IEEE Internet Computing*, special theme on *Virtual Organizations*, volume 12, number 2, March–April 2008, pages 10–36.
10. *IEEE Internet Computing*, the *Spotlight* department, volumes 11 and 12, 2007–2008. This department consists of an article in each issue that introduces a relevant Internet computing technology.
11. *IEEE Internet Computing*, track on *Service-Oriented Computing*, volume 9, 2005. The track consisted of an article in each issue of this volume.

12. (with Michael Fisher, Diana Spears, Michael Wooldridge) *Journal of Applied Logic*, special issue on *Logics for Multiagent Systems*, volume 5, number 2, June 2007, pages 193–388.
13. *Communications of the ACM (CACM)*, special section on *Multiagent Systems on the Net*, volume 42, number 3, March 1999.
14. *International Journal of Cooperative Information Systems (IJCIS)*, special issue on *Selected Papers from CoopIS-97*, volume 6, numbers 3 and 4, September and December 1997.
15. *IEEE Internet Computing*, theme issue on *Agents*, volume 1, number 4, August 1997.
16. *International Journal of Cooperative Information Systems (IJCIS)*, special issues on *Formal Methods in Cooperative Information Systems* with the following themes: *Heterogeneous Databases*, volume 5, number 4, December 1996; *Multiagent Systems*, volume 6, number 1, January 1997.

6.5 Events Organized or Chaired

1. General Cochair, *IEEE International Conference on Services Computing (SCC)*, Barcelona, July 2022.
2. Track Cochair, *Fairness, Transparency, Accountability, and Privacy*, 30th ACM International Conference on User Modeling, Adaptation and Personalization (UMAP), Barcelona, July 2022.
3. Track Chair, *Social Networks and Crowdsourcing*, 37th IEEE International Conference on Distributed Computing Systems (ICDCS), Atlanta, June 2017.
4. General Cochair, *International Conference on Service-Oriented Computing (ICSOC)*, Banff, Alberta, Canada, 2016.
5. Program Cochair, International Symposium and Bootcamp on the Science of Security (HotSoS): 2014.
6. Chair, Challenges and Visions track, International Conference on Autonomous Agents and Multiagent Systems (AAMAS): 2014.
7. Program Cochair, Second International Conference on Mobile Services (MS), Santa Clara, California, 2013.
8. Member, Organizing Committee, International Workshop on Trust, Privacy, Deception, and Fraud, 2001–2004, 2006–2012.
9. Program Cochair, Sixth IEEE International Conference on Web Services (ICWS), Beijing, 2008.
10. Program Cochair, Third International Workshop on Normative Multiagent Systems (NorMAS), Luxembourg, 2008.
11. General Cochair, Fourth International Joint Conference on Autonomous Agents and Multiagent Systems (AAMAS), Utrecht, The Netherlands, July 2005.
12. Program Vice Chair, *Internet and Web Computing*, 25th IEEE International Conference on Distributed Computing Systems (ICDCS), Columbus, Ohio, June 2005.
13. Finance Chair, Third International Joint Conference on Autonomous Agents and Multiagent Systems (AAMAS), New York, July 2004.

14. Program Cochair, Second International Workshop on Agents and Peer-to-Peer Computing (AP2PC), Melbourne, 2003.
15. Member, Organizing International Workshop on Regulated Agent-Based Social Systems: Theories and Applications (RASTA), 2002.
16. Program Cochair, Autonomous Agents Workshop on Deception, Fraud and Trust in Agent Societies, June 2000.
17. Tutorial Program Chair, Fourth International Conference on Multiagent Systems (ICMAS), July 2000.
18. Program Chair (Americas), Fifth International Workshop on Agent Theories, Architectures, and Languages (ATAL), July 1998.
19. General Chair and Americas Program Chair, Fourth International Workshop on Agent Theories, Architectures, and Languages (ATAL), July 1997.
20. Program Chair (Americas), Second IFCIS International Conference on Cooperative Information Systems (CoopIS), June 1997.

6.6 Steering Committee Memberships

1. Member, Steering Committee for Normative Multi-Agent Systems (NorMAS), 2012–present.
2. Member, Steering Committee for PRIMA and Advisory Committee of PRIMA 2010.
3. Member, Board of Directors, International Foundation for Autonomous Agents and Multiagent Systems (IFAAMAS), 2007–2012.
4. Member, Board of Directors, International Foundation for Multiagent Systems (IFMAS), 2004–2006.
5. Chair, Editor-in-Chief Search Committee, *IEEE Internet Computing*, 2003–2004.
6. Member, Steering Committee, *IEEE Transactions on Mobile Computing*, 2001–2004.
7. Steering Committee, International Workshop on Agent Theories, Architectures, and Languages (ATAL), 1999–2007. ATAL was dissolved and merged into IFAAMAS, which was constituted at the same time. I joined the founding IFAAMAS Board of Directors.
8. IEEE Computer Society Magazine Operations Committee, 1999–2002.
9. IEEE Computer Society Publications Board, 1999–2002.

6.7 Tenure and Promotion Reviewing

1. A promotion case for a research institute in France: 2022.
2. The promotion case of a faculty member at a university in Singapore: 2022.
3. The promotion case of a faculty member at a university in New York: 2021.
4. The promotion case of a faculty member at a university in Texas: 2021.
5. The promotion case of a faculty member at a university in Singapore: 2020.

6. The promotion and tenure case of a faculty member at a university in Louisiana: 2019.
7. The promotion and tenure case of a faculty member at a university in New Jersey: 2019.
8. The tenure case of a faculty member at a university in Korea: 2019.
9. The promotion case of a faculty member at a university in United Kingdom: 2018.
10. The promotion case of a faculty member at a university in Victoria, Australia: 2017.
11. The promotion case of a faculty member at one of the universities in Saskatchewan, Canada: 2017.
12. The promotion case of a faculty member at a university in Arizona: 2017.
13. A promotion case for a research institute in France: 2016, 2017.
14. The promotion case of a faculty member at a university in New South Wales, Australia: 2015.
15. The promotion case of a faculty member at a university in Georgia: 2015.
16. The promotion case of a faculty member at a university in California: 2015.
17. The promotion case of a faculty member at a university in Singapore: 2015.
18. The promotion case of a faculty member at a university in Alabama: 2015.
19. The promotion case of a faculty member at a university in Turkey: 2014.
20. The promotion case of a faculty member at a university in New York: 2014.
21. The tenure and promotion case of a faculty member at a university in New York: 2014.
22. The promotion case of a faculty member at a university in Victoria, Australia: 2014.
23. The promotion case of a faculty member at a university in Scotland: 2014.
24. The promotion case of a faculty member at a university in New South Wales, Australia: 2014.
25. The tenure and promotion case of a faculty member at a university in New York: 2013.
26. A directorship case for a research institute in Italy: 2012.
27. The promotion case of a faculty member at a university in Canada: 2012.
28. The reappointment case of a faculty member at a university in New York: 2011.
29. The promotion case of a faculty member at a university in Greece: 2010.
30. The tenure and promotion case of a faculty member at a university in Arizona: 2008, 2010, 2016.
31. The professorship case of a faculty member at a university in Kansas: 2010.
32. The professorship case of a faculty member at a university in Maryland: 2010.
33. The tenure and professorship case of a faculty member at a university in Michigan: 2008, 2009, 2015.
34. A Deanship candidate at a university in North Carolina: 2009.

35. The tenure and promotion case of a faculty member at a major liberals arts college in the Northeast: 2009.
36. The tenure and promotion case of a faculty member at a university in North Carolina: 2008.
37. The professorship case of a faculty member at a university in the Washington, DC area: 2008.
38. The tenure case of a faculty member at one of the universities in Saskatchewan, Canada: 2007.
39. A full professor appointment at a university in Scotland: 2007.
40. The tenure and promotion case of a faculty member at a university in New York: 2007.
41. The tenure and promotion case of a faculty member at a university in the Washington, DC area: 2005.
42. The tenure and promotion case of a faculty member at a university in Arkansas: 2004.
43. The professorship case of a faculty member at a university in Oklahoma: 2003.
44. The tenure and promotion case of a faculty member at a university in South Carolina: 2003.
45. A scientist at the Research Institute for Advanced Computer Science (RIACS), NASA Ames Research Center, California: 2000, 2002.
46. A Cisco Fellow promotion case, Cisco: 2001.
47. The tenure case of a faculty member at one of the universities in Pennsylvania: 2000.
48. The tenure case of a faculty member at one of the universities in Ontario, Canada: 1999.
49. The reappointment case of a faculty member at one of the campuses of the University of North Carolina System: 1998.

6.8 Research Proposal Reviewing

Foreign Agencies The following include my reviewing activities for research funding agencies abroad.

1. Qatar National Research Fund (QNRF): 2014, 2015, 2019, 2020, 2021.
2. Research Grants Council, University Grants Committee, Hong Kong, 1998, 2000–2022.
3. Austrian Science Fund, Austria: 1999, 2003, 2011, 2017.
4. Natural Sciences and Engineering Research Council, Canada: 2003, 2004, 2005, 2007, 2009, 2010, 2015, 2016, 2017, 2018.
5. ERC: European Research Council: 2018.
6. The Netherlands Organisation for Scientific Research (NWO): 2005, 2013, 2017.
7. Swiss Natural Science Foundation: 2007, 2008.
8. European Science Foundation: 2007, 2009.
9. Israel Science Foundation: 2007.
10. US-Israeli Bi-national Science Foundation (BSF): 2005.
11. Australian Research Council, Australia: 2001.

Domestic Agencies The following include my reviewing activities for the National Science Foundation and other domestic agencies.

1. Member of a site-review committee (of an industry-university research center) for the Division of Engineering Education and Centers, a division in the Directorate for Engineering, National Science Foundation: 1995.
2. Membership in National Science Foundation proposal-review panels.
 - (a) Division of Information and Intelligent Systems (and its precursor division), National Science Foundation: 1996, 1998, 1999, 2001, 2002, 2004, 2007, 2008, 2017, 2019, 2020.
 - (b) National Robotics Initiative: 2019.
 - (c) Division of Information and Intelligent System, CISE Research Infrastructure (CRI) program: 2017.
 - (d) Division of Computer and Network Systems: 2008.
 - (e) Information Technology Research Program: 2001 (preproposals and proposals), 2002 (two).
3. Reviewing for National Science Foundation.
 - (a) Division of Civil, Mechanical and Manufacturing Innovation: 2021.
 - (b) Division of Information and Intelligent Systems: 2006, 2013.
 - (c) Small Business Innovation Research (SBIR) grants program: 2002, 2004.
 - (d) Directorate for Biological Sciences (a part of the database activities of the Division for Biological Instrumentation and Resources): 1997.
 - (e) Office of International Science and Engineering (OISE): 1996, 2012.
4. Army Research Office (ARO): 2006, 2018.
5. Kansas First Award program, administered by the American Association for the Advancement of Science: 2002.

6.9 Dissertation Reviewing

1. External member of the Ph.D. committee for Mohammad Sujan Miah, Department of Computer Science, University of Texas at El Paso, El Paso, Texas, 2021–2022. *Advisors:* Dr. Christopher D. Kiekintveld.
2. External member of the Ph.D. committee for Davide Della’Anna, Department of Intelligent Systems, Utrecht University, Utrecht, The Netherlands, 2020–2021. *Advisors:* Dr. Fabiano Dalpiaz and Professor Mehdi Dastani.
3. External member of the Ph.D. committee for Fatma Başak Aydemir, Department of Information Engineering and Computer Science, University of Trento, Italy, 2016. *Advisor:* Dr. Paolo Giorgini.
4. External member of the Ph.D. committee for Jie Jiang, Faculty of Technology Policy and Management, Technical University of Delft, Netherlands, 2014–2015. *Advisor:* Dr. Virginia Dignum.
5. External member of the Ph.D. committee for Hongying Du, Department of Computer Science and Engineering, University of South Carolina, Columbia, 2012–2014. *Advisor:* Dr. Michael N. Huhns.

6. External member of the Ph.D. committee for Weimao Ke, School of Information and Library Science, University of North Carolina, Chapel Hill, 2009–2011. *Advisor:* Dr. Javed Mostafa.
7. External member of the Ph.D. committee for Jie Zhang, Department of Computer Science, University of Waterloo, Waterloo, Canada, 2009. *Advisor:* Dr. Robin Cohen.
8. External examiner for the Ph.D. dissertation of Manish Malhotra, Department of Computer Science, Royal Melbourne Institute of Technology, Melbourne, 2009. *Advisor:* Dr. Andrew Jennings.
9. External member of the Ph.D. committee for Viji Avali, Department of Computer Science and Engineering, University of South Carolina, Columbia, 2008–2012. *Advisor:* Dr. Michael N. Huhns.
10. External member of the Ph.D. committee for Li Xiong, College of Computing, Georgia Institute of Technology, Atlanta, 2004–2005. *Advisor:* Dr. Ling Liu.
11. External examiner for the Ph.D. dissertation of Elizabeth Ogston, Vrije Universiteit, Amsterdam, 2004–2005. *Advisors:* Dr. Frances Brazier and Dr. Maarten van Steen.
12. External examiner for the Ph.D. dissertation of Gil Tidhar, *Organization-Oriented Systems: Theory and Practice*, Department of Computer Science, University of Melbourne, Melbourne, 1998. *Advisors:* Dr. Elizabeth A. Sonenberg and Dr. Anand S. Rao.
13. External member of the Ph.D. committee for Marlene D. Morris, *Turning Browsers Into Buyers: Influencing Consumers—Preference Construction and Timing of Product Purchase*, Fuqua School of Business, Duke University, Durham, NC, 1998. *Advisors:* Dr. James Bettman and Dr. John Payne.

6.10 Panels Chaired

1. “Context-Aware Mobile Services.” *IEEE International Conference on Mobile Services (MS)*, Santa Clara, California, June 2013.
2. “Service Ecosystems: Computing from the Human and Organizational Angles.” *IEEE International Conference on Web Services (ICWS)*, Honolulu, June 2012.
3. “Business Process Management: A Killer App for Agents?” *Third International Joint Conference on Autonomous Agents and MultiAgent Systems (AAMAS)*, New York, July 2004.
4. “Mind Your P’s: Processes, Policies, and Protocols.” *Thirteenth International Conference on the World-Wide Web (WWW)*, New York, May 2004.
5. “Conducting Business using Peer-to-Peer Computing.” *Third International Workshop on Agents and Peer-to-Peer Computing (AP2PC)*, New York, July 2004.
6. “Future of Multiagent Systems.” *Third International Conference on Multiagent Systems (ICMAS)*, Boston, July 2000.
7. “Standards.” *Third International Conference on Multiagent Systems (ICMAS)*, Paris, July 1998.
8. “The Next Big Thing.” *International Joint Conference on Artificial Intelligence (IJCAI)*, Nagoya, Japan, August 1997.

6.11 Participation as Invited Panelist

1. (Juan Antonio Rodriguez and Alessandro Ricci, chairs) “Autonomous Agents and MultiAgent Systems in 2030: Perspectives.” *International Conference on Autonomous Agents and MultiAgent Systems (AAMAS)*, Auckland, May 2020.
2. (Tim Norman, chair) “Trust Modeling and Trusted AI.” *International Workshop on Trust in Society*, Stockholm, July 2018.
3. (Catherine Pelachaud, chair) “Opportunities and Challenges for Emotion-Aware Multi Agent Systems.” *Second International Workshop on Emotion and Sentiment in Social and Expressive Media (ESSEM@AAMAS)*, Istanbul, May 2015.
4. (John Morgan, chair) “Incorporating Emotions in Trust and Social Relationships: A Call to Arms.” *UNC-Army Human Domain Analysis Workshop*, Fayetteville, NC, November 2012.
5. (Claudio Bartolini, chair) “Web Service Integration in the Context of Social Systems.” *Eighth International Conference on Service-Oriented Computing (ICSOC)*, San Francisco, December 2010.
6. (K. Suzanne Barber, chair) “Identity and Trust from Different Points of View.” *International Workshop on Trust in Agent Societies*, Toronto, May 2010.
7. (Rino Falcone, chair) “Challenges and Trends in Trust Research.” *International Workshop on Trust in Agent Societies*, Budapest, May 2009.
8. (Carl Hewitt, chair) “Organizational Computing.” *Sixth International Joint Conference on Autonomous Agents and MultiAgent Systems (AAMAS)*, Hawaii, May 2007.
9. (Aditya Ghose, chair) “Will Agent-Oriented Reshape IS Theory and Practice?” *International Workshop on Agent-Oriented Information Systems (AOIS)*, Hakodate, Japan, May 2006.
10. (K. Suzanne Barber, chair) “Trust Competition Testbed Panel.” *AAMAS Trust Workshop*, New York, July 2004. My talk was on “The Trust Competition Testbed: Some Key Requirements.”
11. (David Martin, chair) “Agent Technology and Web Services Standards.” Joint panel session of the workshops on *Challenges in Open Agent Systems*, *Ontologies in Agent Systems*, and *Web Services and Agent-Based Engineering*, July 2003.
12. (Aris Ousksel, chair) “Agents and Peer-to-Peer Computing.” *AAMAS Workshop on Agents and Peer-to-Peer Computing*, Bologna, July 2002.
13. (John Bell, chair) “Is Rationality an Objective or a Subjective Notion?” *ECAI Workshop on Practical Representation and Reasoning*, Brighton, August 1998.
14. (Ian Gent, chair) “Design of Computational Experiments.” *ECAI Workshop on Empirical Artificial Intelligence*, Brighton, August 1998.
15. (Gerhard Weiß, chair) “The Future of Adaptive and Mobile Information Agents-Travelling Bandits on the Information Highway, or Powerful Information Providers?” *Second International Workshop on Cooperative Information Agents (CIA)*, Paris, July 1998.
16. (Anupam Joshi, chair) “Cooperative Multiagent Systems for the Web.” *Second IFCIS International Conference on Cooperative Information Systems (CoopIS)*, Kiawah Island, South Carolina, June 1997.

17. (Nick Jennings and Rosaria Conte, chairs) “Agents and Norms.” *International Conference on Multi-agent Systems (ICMAS) Workshop on Norms, Obligations, and Conventions*, Kyoto, December 1996.
18. (Cristiano Castelfranchi, chair) “Agents and Commitments.” *International Conference on Multiagent Systems (ICMAS)*, San Francisco, June 1995.

6.12 Magazine Columns

1. (Munindar P. Singh) “Being Interactive.” Bimonthly column, *IEEE Internet Computing*, January 1999–December 2002.
2. (Michael N. Huhns and Munindar P. Singh) “Agents on the Web.” Bimonthly column, *IEEE Internet Computing*, 1997–1998.

6.13 Summer School Lectures

1. “Service-Oriented Computing.” International Summer School on Multiagent Systems, Hyderabad, India, July 2005.
2. “Service-Oriented Computing.” University of Trento International Doctoral School, Trento, Italy, June 2004.

6.14 Conference Tutorials

1. (Pradeep K. Murukannaiah, Nirav Ajmeri, and Munindar P. Singh) “Ethics in Sociotechnical Systems.” *36th Conference on Artificial Intelligence (AAAI)*, Vancouver, February 2022.
2. (Amit K. Chopra, Samuel H. Christie V, and Munindar P. Singh) “Interaction-Oriented Programming: An Application Semantics Approach for Engineering Decentralized Applications.” *40th ACM Symposium on Principles of Distributed Computing (PODC)*, Salerno, Italy, July 2021.
3. (Pradeep K. Murukannaiah, Nirav Ajmeri, and Munindar P. Singh) “Ethics in Sociotechnical Systems.” *20th International Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, London, May 2021.
4. (Pradeep K. Murukannaiah, Nirav Ajmeri, and Munindar P. Singh) “Ethics in Sociotechnical Systems.” *29th International Joint Conference on Artificial Intelligence (IJCAI)*, Yokohama, July 2020. This conference was postponed to January 2021.
5. (Amit K. Chopra and Munindar P. Singh) “Programming for Autonomy.” *41st ACM SIGPLAN Conference on Programming Language Design and Implementation (PLDI)*, London, June 2020.
6. (Pradeep K. Murukannaiah, Nirav Ajmeri, and Munindar P. Singh) “Ethics in Sociotechnical Systems.” *19th International Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, Auckland, May 2020.
7. (Amit K. Chopra and Munindar P. Singh) “Engineering Distributed Systems via Protocols and Commitments.” *46th ACM Symposium on Principles of Programming Languages (POPL)*, Cascais, Portugal, January 2019.
8. (Munindar P. Singh and Amit K. Chopra) “The Internet of Things and Multiagent Systems.” *25th International Joint Conference on Artificial Intelligence (IJCAI)*, New York, July 2016.

9. (Munindar P. Singh and Amit K. Chopra) “The Internet of Things and Multiagent Systems.” *15th International Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, Singapore, May 2016.
10. (Amit K. Chopra and Munindar P. Singh) “Decentralized Multiagent Systems.” *Fifteenth International Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, Singapore, May 2016.
11. (Munindar P. Singh and Amit K. Chopra) “The Internet of Things and Multiagent Systems.” *14th International Joint Conference on Artificial Intelligence (IJCAI)*, Buenos Aires, July 2015.
12. (Munindar P. Singh and Amit K. Chopra) “The Internet of Things and Multiagent Systems.” *9th IEEE International Conference on Research Challenges in Information Science (RCIS)*, Athens, May 2015.
13. (Amit K. Chopra and Munindar P. Singh) “Decentralized Multiagent Systems.” *14th International Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, Istanbul, May 2015.
14. (Munindar P. Singh), “Policy-Governed Secure Collaboration.” *2nd Symposium and Bootcamp on the Science of Security (HotSoS)*, April 2015.
15. (Munindar P. Singh and Nirmal Desai), “Multidisciplinary Views of Business Contracts.” *8th International Conference on Service-Oriented Computing (ICSOC)*, December 2010.
16. (Munindar P. Singh and Michael N. Huhns) “Agents for Web Services.” *20th International Joint Conference on Artificial Intelligence (IJCAI)*, Hyderabad, January 2007.
17. (Munindar P. Singh and Michael N. Huhns) “Service-Oriented Computing.” *19th Annual ACM Conference on Object-Oriented Programming, Systems, Languages, and Applications (OOPSLA)*, Vancouver, October 2004.
18. (Munindar P. Singh and Michael N. Huhns) “Agents for Web Services.” *3rd International Joint Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, New York, July 2004.
19. (Munindar P. Singh and Michael N. Huhns) “Foundations of Web Services: Architectures, Description and Engagement.” *13th International World Wide Web Conference (WWW)*, New York, May 2004.
20. (Munindar P. Singh and Michael N. Huhns) “Foundations of Web Services: Engagement, Discovery and Composition.” *13th International World Wide Web Conference (WWW)*, New York, May 2004.
21. (Munindar P. Singh and Michael N. Huhns) “Web Service Composition and Service Composition Techniques.” *2nd International Joint Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, Melbourne, July 2003.
22. (Munindar P. Singh and Michael N. Huhns) “Fundamentals of Web Services.” *1st International Joint Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, Bologna, July 2002.
23. (Munindar P. Singh and Michael N. Huhns) “Web Service Composition.” *11th International World Wide Web Conference (WWW)*, Honolulu, May 2002.
24. (Munindar P. Singh and Michael N. Huhns) “Service Composition Techniques.” *11th International World Wide Web Conference (WWW)*, Honolulu, May 2002.
25. (Munindar P. Singh and Michael N. Huhns) “Principles of Agents and Multiagent Systems: Social, Ethical, and Legal Abstractions and Reasoning.” *16th International Joint Conference on Artificial Intelligence (IJCAI)*, Stockholm, July 1999.

26. (Michael N. Huhns and Munindar P. Singh) “Agents and Multiagents in the Internet and Intranets.” *16th International Joint Conference on Artificial Intelligence (IJCAI)*, Stockholm, July 1999.
27. (Munindar P. Singh and Michael N. Huhns) “Agents and Multiagents in Information-Rich Applications.” *2nd International Conference on Multiagent Systems (ICMAS)*, Paris, July 1998.
28. (Munindar P. Singh and Michael N. Huhns) “Cooperative Information Systems: Agents Meet Databases.” *15th International Joint Conference on Artificial Intelligence (IJCAI)*, Nagoya, Japan, August 1997.
29. (Munindar P. Singh and Michael N. Huhns) “Cooperative Information Systems.” *12th European Conference on Artificial Intelligence (ECAI)*, Budapest, August 1996.
30. (Munindar P. Singh and Michael N. Huhns) “Agents at Work: Promises, Paradigms, Problems.” *12th IEEE International Conference on Data Engineering (ICDE)*, New Orleans, February 1996.
31. (Michael N. Huhns and Munindar P. Singh) “Cooperative Information Systems.” *14th International Joint Conference on Artificial Intelligence (IJCAI)*, Montréal, August 1995.
32. (Munindar P. Singh and Michael N. Huhns) “Cooperative Information Systems.” *15th IEEE International Conference on Distributed Computing Systems (ICDCS)*, Vancouver, May 1995.
33. (Munindar P. Singh and Michael N. Huhns) “Cooperative Information Systems.” *6th International Conference on Management of Data (COMAD)*, Bangalore, December 1994.
34. (Michael N. Huhns and Munindar P. Singh) “Distributed Artificial Intelligence.” *2nd International Conference on Cooperative Information Systems (CoopIS)*, Toronto, May 1994.

6.15 Conference Senior Program Committee Memberships

1. International Conference on Autonomous Agents and Multiagent Systems (AAMAS): 2002, 2003, 2007, 2008, 2011, 2018, 2022.
2. The Web Conference (previously World Wide Web Conference): 2022.
3. International Joint Conference on Artificial Intelligence (IJCAI): 2009, 2016, 2017, 2018, 2021.
4. Blue Sky (née Vision and Challenges) Track, International Conference on Autonomous Agents and Multiagent Systems (AAMAS): 2012, 2013, 2015, 2016, 2017, 2018, 2019, 2020, 2021.
5. AAAI Conference on Artificial Intelligence (AAAI): 2012, 2013.
6. International Conference on Principles and Practice of Multi-Agent Systems, 2010, 2011.
7. Area Chair for *Internet Technology and Informatics*, International Symposium on Parallel Architectures, Algorithms, and Networks (ISPAN), Melbourne: 2008.
8. Area Coordinator for *Service Assembly*, Fourth International Conference on Service Oriented Computing (ICSOC): 2006.

6.16 Conference Program Committee Memberships

1. AAAI/ACM Conference on Artificial Intelligence, Ethics, and Society (AIES): 2019, 2022.
2. International Joint Conference on Artificial Intelligence (IJCAI): 2009, 2016, 2017, 2018, 2021.
3. Blue Sky Track, International Conference on Autonomous Agents and Multiagent Systems (AAMAS): 2022.
4. AAAI Conference on Artificial Intelligence (AAAI) Special Tracks: 2022, 2023.
5. The Web Conference (previously World Wide Web Conference): 2008, 2009, 2019.
6. International Joint Conference on Artificial Intelligence (IJCAI): 2017, 2019, 2020, 2021.
7. International Conference on Autonomous Agents and Multiagent Systems (AAMAS): 2009, 2021.
8. International Conference on Artificial Intelligence and Law (ICAIL): 2017, 2019.
9. AAAI Conference on Artificial Intelligence (AAAI): 1994, 2007, 2008, 2019.
10. IFIP International Conference on Coordination Models and Languages: 2016.
11. International Symposium and Bootcamp on the Science of Security (HotSoS): 2015, 2016.
12. International Conference on Service Oriented Computing (ICSOC): 2004, 2008, 2010, 2012.
13. IEEE International Conference on Web Services (ICWS): 2004, 2006, 2007, 2010, 2011, 2012.
14. IEEE Conference on Commerce and Enterprise Computing (CEC), 2011.
15. International Conference on Semantic Systems (ISEM): 2010.
16. International Conference on Business Information Systems (BIS): 2010.
17. International Conference on Electronic Commerce (ICEC): 2007, 2008, 2010.
18. International Conference on Knowledge Representation (KR): 2010.
19. European Semantic Web Conference (ESWC): 2007, 2008, 2009.
20. IEEE International Conference on High Performance Computing and Communications (HPCC): 2009.
21. International Semantic Web Conference (ISWC): 2003, 2006, 2008.
22. AAAI Conference on Artificial Intelligence, Nectar Papers Program Committee, (AAAI): 2006, 2007, 2008.
23. AAAI Conference on Artificial Intelligence (AAAI): 1994, 2007, 2008.
24. IEEE/WIC International Conference on Intelligent Agent Technology (IAT): 2003, 2007.
25. International Conference on Autonomous Agents (AA): 1997, 1998, 1999, 2001.
26. Third International and Interdisciplinary Conference on Modeling and Using Context (CONTEXT): 1999, 2001.

27. International Conference on Multiagent Systems (ICMAS): 1996, 1998, 2000.
28. IEEE International Conference on Distributed Computing Systems (ICDCS): 1998.
29. Third IFCIS International Conference on Cooperative Information Systems (CoopIS): 1996, 1998.
30. Fourteenth IEEE International Conference on Data Engineering (ICDE): 1998.
31. Third International Conference on Cooperating Knowledge-Based Systems: 1994.

6.17 Symposia and Workshop Program Committee Memberships

1. All The Agents Challenge. In conjunction with the International Semantic Web Conference (ISWC): 2021.
2. International Workshop on Deceptive AI: 2020.
3. International Workshop on Responsible Artificial Intelligence Agents (RAIA): 2019.
4. Workshop on Distributed Analytics InfraStructure and Algorithms for Multi-Organization Federations (DAIS): 2019.
5. International Workshop on AI and Data Mining for Services (ADMS): 2018.
6. International Workshop on Blockchain Technologies for Multi-Agent Systems (BCT4MAS): 2018.
7. International Workshop on Policy-based Autonomic Data Governance (PADG): 2017, 2018.
8. International workshop on Socio-Cognitive Systems (SCS): 2018.
9. International Workshop on Crowd-Based Requirements Engineering: 2017.
10. SPLASH Workshop on Programming Systems, Languages, and Applications based on Agents, Actors, and Decentralized Control (AGERE!): 2011, 2012.
11. ECAI Workshop on Rights and Duties of Autonomous Agents (RDA2), 2012.
12. Informatik Workshop on Protocol based Modelling of Business Interactions (PMBI), 2011.
13. International Workshop on Programming Multiagent Systems (ProMAS): 2010, 2011.
14. International Workshop on Coordination, Organization, Institutions and Norms in Agent Systems (COIN): 2010, 2011.
15. International Workshop on Multi-Agent Systems and Collaborative Technologies: 2011, 2011.
16. International Pragmatic Web Conference Track at I-SEMANTICS (PragWEB): 2010.
17. International Workshop on Agent Communication (AC): 2010.
18. International Workshop on Service-Oriented Computing: Agents, Semantics, and Engineering (SO-CASE): 2010.
19. International Conference on the Virtual Computing Initiative, (ICVCI): 2007, 2008, 2009.

20. International Workshop on Agents, Web Services and Ontologies, Integrated Methodologies (AWE-SOME) as part of Multi-Agent Logics, Languages, and Organisations Federated Workshops (MAL-LOW): 2009.
21. IEEE International Workshop on Scientific Workflows (SWF): 2008, 2009.
22. International Workshop on Agents for Autonomic Computing (AAC): 2008, 2009.
23. International Conference on Practical Applications of Agents and Multi-Agent Systems (PAAMS): 2009.
24. International Conference on Reputation (ICORE): 2009.
25. International Conference on Computer Mediated Social Networking (ICCMSN): 2008.
26. Workshop on Community-Based Evolution of Knowledge-intensive Systems (COMBEK): 2008.
27. European Workshop on Multi-Agent Systems (EUMAS): 2007.
28. International Workshop on Declarative Agent Languages and Technologies (DALT): 2007.
29. Workshop on Global Service Delivery Platforms at the Conference on Electronic Commerce: 2006.
30. International Workshop on Coordination of Inter-Organizational Workflow: Agent and Semantic Web Based Models (CIOW): 2006.
31. International Workshop on Artificial Intelligence and Service-Oriented Computing: 2006.
32. First Workshop on Semantics Enabled Networks and Services (SeNS): 2006.
33. Fifth International Workshop on Engineering Societies in the Agents' World (ESAW): 2001, 2003, 2004.
34. VLDB Workshop on Semantic Web and Databases: 2003.
35. First International Workshop on Computational Autonomy– Potential, Risks, Solutions (AUTONOMY): 2003.
36. Third International Symposium on Electronic Commerce (ISEC): October 2002.
37. First International Workshop on Internet Computing and E-Commerce (ICEC): 2001.
38. FORTE/PSTV Workshop on Interaction Protocol Engineering: 2002.
39. Third IEEE/IPSJ Symposium on Applications and the Internet (SAINT): 2003. Sponsored by the IEEE Computer Society and the Information Processing Society of Japan.
40. Agent Communication Languages and Conversation Policies, Autonomous Agents and Multi-Agent Systems Conference: 2002.
41. ECAI Workshop on Model Checking and Artificial Intelligence (MoChArt): 2002.
42. Sixth International Workshop on Cooperative Information Agents (CIA): 2001, 2002.
43. Seventh International Workshop on Agent Theories, Architectures, and Languages (ATAL): 1994, 1999, 2000, 2001.

44. Autonomous Agents Workshop on Agent Communication: 2000.
45. Autonomous Agents Workshop on Norms and Institutions in Multi-Agent Systems: 2000.
46. AAAI Workshop on Negotiation: Settling Conflicts and Identifying Opportunities: 1999.
47. AAAI Workshop on Agents' Conflicts: 1999.
48. Third Workshop on the Semantics and Pragmatics of Dialogue (Amstelogue): 1999.
49. IJCAI Workshop on Agent Communication Languages: 1999.
50. International Conference on Autonomous Agents Workshop on Deception, Fraud and Trust in Agent Societies: 1998, 1999, 2019.
51. International Conference on Autonomous Agents Workshop on Specifying and Implementing Conversation Policies: 1999.
52. International Workshop on Intelligent Agents for Telecommunications Applications (IATA): 1998.
53. International Workshop on Intelligent Agents on the Internet and Web: 1998.
54. Second International Workshop on Cooperative Information Agents (CIA): 1998.
55. Workshop on Theoretical and Practical Foundations of Intelligent Agents: 1997.
56. International Conference on Multiagent Systems Workshop on Norms, Obligations, and Conventions: 1996.
57. First Workshop on Theoretical and Practical Foundations of Intelligent Agents: 1996.
58. European Conference on Artificial Intelligence Workshop on Agent Theories, Architectures, and Languages (ATAL): 1996.
59. International Joint Conference on Artificial Intelligence Workshop on Agent Theories, Architectures, and Languages (ATAL): 1995.
60. European Conference on Artificial Intelligence Workshop on Agent Theories, Architectures, and Languages (ATAL): 1994.

6.18 Other Peer Reviewing

Of Book Proposals

1. Edited research collection proposal on cybersecurity and psychology, Elsevier, 2020.
2. Edited research collection proposal on humans and AI, Elsevier, 2020.
3. Undergraduate textbook proposal on agent programming, Wiley, 2005.
4. Research monograph proposal on multiagent systems, Wiley, 2005.
5. Undergraduate textbook manuscript on databases, Addison Wesley, 2004.
6. Undergraduate textbook manuscript on databases, Addison Wesley Longman, 2001.

7. Undergraduate textbook manuscript on databases, Prentice Hall, 2001.
8. Edited research collection proposal, John Wiley & Sons, 2000.
9. Undergraduate textbook proposal on data structures, Addison Wesley Longman, 2000.
10. Undergraduate textbook manuscript on databases, Addison Wesley Longman, 2000.
11. Proposed undergraduate textbook on databases, Addison Wesley Longman, 2000.
12. Proposed undergraduate textbook on data structures, McGraw-Hill, 1999.
13. Proposed undergraduate textbook on data structures, Prentice Hall, 1999.
14. Proposed undergraduate textbook on databases, Addison Wesley Longman, 1999.
15. *The Encyclopedia of Electrical and Electronics Engineering*, John Wiley & Sons, 1998.
16. Proposed 2nd edition of an undergraduate textbook on databases, Addison Wesley Longman, 1998.
17. Book proposal for the *International Series on Advances in Database Systems*, Kluwer, 1997.

Of Journal Submissions Excluding reviews I completed while an editorial board member.

1. *ACM Journal on Responsible Computing*: 2022.
2. *Digital Society*, Springer: 2021, 2022.
3. *Minds and Machines*, Springer: 2010, 2021.
4. *Artificial Intelligence*, Elsevier: 2010–2012, 2017, 2019.
5. *ACM Transactions on Software Engineering and Methodology*: 2019.
6. *Ethics and Information Technology*, special issue on Ethics and Artificial Intelligence, Springer: 2017.
7. *Journal of AI Research*, JAIR Foundation: 2006, 2007, 2010.
8. *Synthese*, Springer: 2016.
9. *Frontiers in Psychology*, Springer: 2014.
10. *Science of Computer Programming*, Elsevier: 2013.
11. *IEEE Computer*, IEEE: 2007, 2010, 2012, 2018.
12. *ACM Transactions on Autonomous and Adaptive Systems (TAAS)*, ACM, 2010, 2012.
13. *Computational Intelligence (CI)*, Basil Blackwell. Founded by the National Research Council of Canada (NRCC): 2004, 2008, 2011.
14. *ACM Transactions on the Web (TWEB)*, ACM: 2007, 2008, 2010.
15. *IEEE Transactions on Dependable and Secure Computing (TDSC)*, IEEE: 2010, 2011.
16. *MIS Quarterly*: 2009, 2010.

17. *Decision-Support Systems*: 2009, 2010.
18. *International Journal of Parallel, Emergent and Distributed Systems*, Taylor & Francis, 2010.
19. *ACM Transactions on Internet Technology (TOIT)*, ACM: 2006, 2009.
20. *IEEE Transactions on Services Computing (TSC)*, IEEE: 2008, 2009.
21. *IEEE Transactions on Software Engineering (TSE)*, IEEE: 2004, 2009.
22. *WWW Journal*, Springer: 2008, 2009.
23. *IEEE Transactions on Knowledge and Data Engineering*, IEEE: 2003, 2004, 2008.
24. *IEEE Transactions on Systems, Man, and Cybernetics, Part A (TSMC-A)*: 2008.
25. *IEEE Transactions on Systems, Man, and Cybernetics, Part C (TSMC-C)*: 2006, 2008.
26. *Multi-Agent and Grid Systems*, IOS Press: 2008.
27. *Journal of Computer Security*, IOS Press: 2008.
28. *Communications of the ACM (CACM)*, ACM: 2002, 2004, 2006, 2008.
29. *Frontiers of Computer Science in China*, Springer: 2007.
30. *IEEE Software*, IEEE: 2007.
31. *ACM Computing Surveys*: 2007.
32. *IBM Systems Journal*: 2007.
33. *AI Journal*, Elsevier: 2007.
34. *VLDB Journal*, VLDB Foundation: 2007.
35. *Web Intelligence and Agent Systems*: 2007.
36. *ACM Transactions on Computational Logic*, ACM: 2005, 2006.
37. *IEEE Transactions on Parallel and Distributed Systems*, IEEE.
38. *Theoretical Computer Science*, Elsevier.
39. *IEE Proceedings—Software*: 2001. IEE is the Institute of Electrical Engineers.
40. *Information Technology and Management*, Baltzer.
41. *IBM Systems Journal*, IBM.
42. *Information Systems—Databases: Their Creation, Management and Utilization*, Pergamon.
43. *Computers and Artificial Intelligence*, Slovak Academy of Sciences.
44. *Journal of Intelligent Information Systems*, Kluwer.
45. *Knowledge and Information Systems (KAIS): An International Journal*, Springer-Verlag.

46. *Applied Artificial Intelligence: An International Journal*, Taylor & Francis.
47. *IEEE Transactions on Pattern Analysis and Machine Intelligence (IEEE-PAMI)*, Institute of Electrical and Electronics Engineers Computer Society.
48. *Journal of Logic and Computation*, Oxford University Press.
49. *Trends in Cognitive Science*, Elsevier.
50. *Machine Learning*, Kluwer.
51. *Journal of Computing and Information Technology (CIT)*, University of Zagreb, Croatia. ISSN 1330-1136.
52. *Journal of Experimental and Theoretical Artificial Intelligence (JETAI)*, Taylor & Francis.
53. *Distributed and Parallel Databases (DAPD)*, Kluwer.
54. *Computers and Mathematics with Applications (CAM)*, Pergamon Press.
55. *ACM Transactions on Information Systems (TOIS)*, ACM.
56. *IEEE Expert: Intelligent Systems & Their Applications*, Institute of Electrical and Electronics Engineers Computer Society.
57. *International Journal of Cooperative Information Systems (IJCIS)*, World Scientific.
58. *IEEE Transactions on Systems, Man, and Cybernetics (IEEE-SMC)*, Institute of Electrical and Electronics Engineers Computer Society.
59. *International Journal of Intelligent Systems (IJIS)*, John Wiley.
60. *Journal of Organizational Computing (JOC)*, Ablex.
61. *Journal of Applied Intelligence (APIN)*, Kluwer.

Of Conference Submissions Excluding conferences for which I was a program committee member.

1. International ACM Conference on Electronic Commerce (EC): 1999, 2008.
2. International Joint Conference on Artificial Intelligence (IJCAI): 1991, 1993, 1995, 1997, 1999, 2001, and 2003.
3. ACM Symposium on the Principles of Distributed Computing, 2000.
4. 7th CSLI Workshop on Logic, Language and Computation (LLC): 1998.
5. IEEE Symposium on Logic in Computer Science (LICS): 1995.
6. International Conference on Database Systems for Advanced Applications (DASFAA): 1995.
7. Conference of the American Association for Artificial Intelligence (AAAI): 1990.
8. International Conference on Data Engineering (ICDE): 1994.
9. International Conference on Intelligent and Cooperative Information Systems (ICICIS): 1993.

10. International Conference on Distributed Artificial Intelligence (DAI): 1990 and 1992.
11. International Conference on Logic Programming Workshop on Deductive Databases: 1993.
12. International Workshop on Cooperation Among Knowledge-Based Systems (CKBS): 1990.
13. International Conference on Industrial and Engineering Applications of Artificial Intelligence and Expert Systems (IEA/AIE): 1991.
14. American Association for Artificial Intelligence Workshop on Cooperation Among Heterogeneous Intelligent Systems (CHIS): 1991 and 1992.