

Jacob W. Crandall

Professor

Computer Science Department
Brigham Young University
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Research Interests

Artificial intelligence: Human-machine cooperation, robotics, machine learning, game theory

Appointments

Sep 2021 – **Brigham Young University**, Provo, UT
present *Professor*, Computer Science Department

Aug 2016 – **Brigham Young University**, Provo, UT
Aug 2021 *Associate Professor*, Computer Science Department

Jan 2013 – **Masdar Institute of Science and Technology**, Abu Dhabi, UAE
Aug 2016 *Associate Professor*, Dept. of Electrical Engineering and Computer Science

Jul 2008 – **Masdar Institute of Science and Technology**, Abu Dhabi, UAE
Dec 2012 *Assistant Professor*, Computing and Information Science Program

Nov 2009 – **Massachusetts Institute of Technology**, Cambridge, MA
Nov 2011 *Research Affiliate*, Technology and Development Program

Jul 2008 – **Massachusetts Institute of Technology**, Cambridge, MA
Jun 2009 *Visiting Scholar*, Technology and Development Program

Jan 2006 – **Massachusetts Institute of Technology**, Cambridge, MA
Jun 2008 *Postdoctoral Associate*, Department of Aeronautics and Astronautics
Supervisor: Prof. Mary L. Cummings, Humans and Automation Lab

Jun 2000 – **Brigham Young University**, Provo, UT
Dec 2005 *Research Assistant*, Computer Science Department
Advisor: Prof. Michael A. Goodrich, HCMI-MAGICC Lab

Education

Apr 2006 **Brigham Young University**, Provo, UT
Ph.D. in Computer Science
Dissertation: *Learning Successful Strategies in Repeated General-Sum Games*

Apr 2004 **Brigham Young University**, Provo, UT
M.S. in Computer Science
Thesis: *Towards Developing Effective Human-Robot Systems*

Aug 2001 **Brigham Young University**, Provo, UT
B.S. in Computer Science (minor in Mathematics)

Publications

Designations:

- An underlined name indicates a student of whom I was the primary supervisor on the work
- An *italicized name* indicates a student I closely worked with on the work, but did not supervise
- * indicates corresponding author

High-Impact Publications

Includes papers that meet one or more of the following attributes:

- Journal articles and book chapters
- Papers published in top-tier conferences (acceptance rate < 30%)
- Papers published in conferences and workshops having 50+ citations ([Google Scholar profile](#))
- Papers that received a best-paper award

1. G. LeMasurier, A. Gautam, Z. Han, **J. W. Crandall**, and H. Yanco. Reactive or Proactive? How Robots Should Explain Failures. To appear in *Proceedings of the 19th ACM/IEEE International Conference on Human-Robot Interaction (HRI)*, 2024.
Acceptance rate: 25%
2. X. Cao, A. Gautam, T. Whiting, S. Smith, M. A. Goodrich, and **J. W. Crandall**. Robot Proficiency Self-Assessment Using Assumption-Alignment Tracking. *IEEE Transactions on Robotics*, Vol. 39, No. 4, pp. 3279-3298, August 2023.
3. X. Cao, **J. W. Crandall**, E. Pedersen, A. Gautam, and M. A. Goodrich. Proficiency Self-Assessment without Breaking the Robot: Anomaly Detection using Assumption-Alignment Tracking from Safe Experiments. *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA)*, 2023.
Finalist for the ICRA 2023 Outstanding Conference Paper Award; Acceptance rate: 43%
4. E. Pedersen and **J. W. Crandall**. AlegAATr the Bandit. *Proceedings of the European Conference on Artificial Intelligence (ECAI)*, 2023.
Acceptance rate: 24%
5. X. Cao, **J. W. Crandall**, and M. A. Goodrich. Improving Robot Proficiency Self-Assessment via Meta-Assessment. *IEEE Robotics and Automation Letters (RA-L)*, Vol. 8, No. 11, pp. 7297-7303, 2023.
6. A. Norton, H. Admoni, **J. W. Crandall**, T. Fitzgerald, A. Gautam, M. A. Goodrich, A. Saretsky, M. Scheutz, R. Simmons, A. Steinfeld, H. Yanco. Metrics for Robot Proficiency Self-Assessment and Communication of Proficiency in Human-Robot Teams. *ACM Transactions on Human-Robot Interaction*, Vol. 11(3), Actical NO. 29, 2022.
7. T. Whiting, A. Gautam, J. Tye, M. Simmons, J. Henstrom, **J. W. Crandall***. Confronting Barriers to Human-Robot Cooperation: Balancing Efficiency and Risk in Machine Behavior. *iScience*, Vol. 24, 101963, 2021.
8. **J. W. Crandall***. When Autonomous Agents Model Other Agents: An Appeal for Altered Judgment Coupled with Mouths, Ears, and a Little More Tape. *Artificial Intelligence*, Vol. 280, 103219, 2020.
9. I. Rahwan*, **J. W. Crandall**, and J. F. Bonnefon. Intelligent Machines as Social Catalysts. *Proceedings of the National Academy of Sciences*, Vol. 117(114), pp. 7555-7557, 2020. (Invited commentary)

10. *F. Ishowo-Oloko*, J. F. Bonnefon, Z. Soroye, **J. W. Crandall**, I. Rahwan*, and T. Rahwan*. Behavioural evidence for a transparency-efficiency tradeoff in human-machine cooperation. *Nature Machine Intelligence*, Vol. 1, pp. 517-521, 2019.
This article ranks in the top 0.25% for online attention ([Altmetric](#))
11. I. Rahwan*, M. Cebrian, N. Obradovich, J. Bongard, J. F. Bonnefon, C. Breazeal, **J. W. Crandall**, N. A. Christakis, I. D. Couzin, M. O. Jackson, N. R. Jennings, E. Kamar, I. M. Kloumann, H. Larochelle, D. Lazer, R. McElreath, A. Mislove, D. C. Parkes, A. Pentland, M. E. Roberts, A. Shariff, J. B. Tenenbaum, and M. Wellman. Machine Behaviour. *Nature*, Vol. 568, pp. 477-486, 2019.
Journal Impact Factor: 43.070; This article ranks in the top 0.05% for online attention ([Altmetric](#))
12. **J. W. Crandall***, M. Oudah, Tennom, *F. Ishowo-Oloko*, S. Abdallah, J. F. Bonnefon, M. Cebrian, A. Shariff, M. A. Goodrich, and I. Rahwan*. Cooperating with Machines. *Nature Communications*, Vol. 9(1), Article No. 233, 2018.
Journal Impact Factor: 12.353; This article ranks near the top 0.15% for online attention ([Altmetric](#)); 3rd most accessed article in Nature Communication's *Top 50: Physics* as of July 2019
13. M. Oudah, T. Rahwan, T. Crandall, and **J. W. Crandall***. How AI Wins Friends and Influences People in Repeated Games with Cheap Talk. *Proceedings of the Thirty-Second Conference on Artificial Intelligence (AAAI)*, New Orleans, LA, Feb 2018.
Acceptance rate: 25%
14. *Z. Almahmoud*, **J. W. Crandall**, K. Elbassioni, T. T. Nguyen*, and M. Roozbehani. Dynamic Pricing in Smart Grids Under Thresholding Policies. *IEEE Transactions on Smart Grid*, Vol. 10(3), pp. 3415-3429, 2019.
Journal Impact Factor: 6.645
15. W. Shen*, **J. W. Crandall**, K. Yan, and C. Lopes. Information Design in Crowdfunding under Thresholding Policies. In *Proceedings of the Seventeenth International Conference on Autonomous Agents and Multi-agent Systems (AAMAS)*, Stockholm, Sweden, Jul 2018.
Acceptance rate: 25%
16. W. Shen, A. Al Khemeiri, A. Almehrzi, W. Al Enezi, I. Rahwan, and **J. W. Crandall***. Regulating Highly Automated Robot Ecologies: Insights from Three User Studies. In *Proceedings of the Fifth International Conference on Human-Agent Interaction (HAI)*, Bielefeld, German, Oct 2017.
Best Student Paper Award; Acceptance rate: 47%
17. *S. V. Albrecht**, **J. W. Crandall**, and S. Ramamoorthy. Belief and Truth in Hypothesised Behaviors. *Artificial Intelligence*, Vol. 235, pp. 63-94, 2016.
Journal Impact Factor: 4.797
18. W. Shen*, C. V. Lopes, and **J. W. Crandall**. An Online Mechanism for Ridsharing in Autonomous Mobility-on-Demand Systems. In *Proceedings of the International Joint Conference on Artificial Intelligence (IJCAI)*, New York City, NY, Jul 2016.
Acceptance rate: 25%
19. **J. W. Crandall***. Robust Learning in Repeated Stochastic Games using Meta-Gaming. In *Proceedings of the International Joint Conference on Artificial Intelligence (IJCAI)*, Buenos Aires, Argentina, Jul 2015.
Acceptance rate: 29%

20. M. Oudah, V. Babushkin, T. Chenlinangjia, and **J. W. Crandall***. Learning to Interact with a Human Partner. In *Proceedings of the Tenth ACM/IEEE International Conference on Human-Robot Interaction (HRI)*, Portland, OR, Mar 2015.
Acceptance rate: 25%
21. S. V. Albrecht*, **J. W. Crandall**, and S. Ramamoorthy. An Empirical Study on the Practical Impact of Prior Beliefs over Policy Types. In *Proceedings of the Twenty-Ninth Conference on Artificial Intelligence (AAAI)*, Austin, TX, Jan 2015.
Acceptance rate: 27%
Note: S. V. Albrecht was a visiting Ph.D. student to my group from Univ. of Edinburgh (advised by S. Ramamoorthy)
22. **J. W. Crandall***. Towards Minimizing Disappointment in Repeated Games. *Journal of Artificial Intelligence Research*, Vol. 49, pp. 111-142, 2014.
Journal Impact Factor: 2.284
23. V. Manohar and **J. W. Crandall***. Programming Robots to Express Emotions: Interaction Paradigms, Communication Modalities, and Context. *IEEE Transactions on Human-Machine Systems*, Vol. 44, No. 3, pp. 362-373, 2014.
Journal Impact Factor: 2.493
24. M. Elidrisi*, N. Johnson, M. Gini, and **J. W. Crandall**. Fast Adaptive Learning in Repeated Stochastic Games by Game Abstraction. In *Proceedings of the Thirteenth International Conference on Autonomous Agents and Multi-agent Systems (AAMAS)*, Paris, France, May 2014.
Acceptance rate: 24%
25. M. A. Goodrich*, **J. W. Crandall**, and E. Barakova. Teleoperation and Beyond for Assistive Humanoid Robots. *Reviews of Human Factors and Ergonomics* (David Kaber, Ed.), Vol. 9, No. 1, pp. 175-226, 2013.
26. **J. W. Crandall***. Just Add Pepper: Extending Learning Algorithms for Repeated Matrix Games to Repeated Markov Games. In *Proceedings of the Eleventh International Conference on Autonomous Agents and Multi-agent Systems (AAMAS)*, Valencia, Spain, June 2012.
Acceptance rate: 20%
27. V. Harutyunyan, V. Manohar, I. Ghezehei, and **J. W. Crandall***. Cognitive Telepresence in Human-Robot Interactions. *Journal of Human-Robot Interaction*, Vol. 1, No. 2, pp. 158-182, 2012.
28. **J. W. Crandall***, M. L. Cummings, M. Della Penna, and P. M. A. deJong. Computing the Effects of Operator Attention Allocation in Human Control of Multiple Robots. *IEEE Transactions on Systems, Man, and Cybernetics, Part A: Systems and Humans*, Vol. 41, No. 3, pp. 385-397, May 2011.
29. **J. W. Crandall*** and M. A. Goodrich. Learning to Compete, Cooperate, and Compromise Using Reinforcement Learning. *Machine Learning*, Vol. 82, No. 3, pp. 281-314, Mar 2011.
Journal Impact Factor: 1.848
30. **J. W. Crandall***, A. Ahmed, and M. A. Goodrich. Learning in Repeated Games with Minimal Information: The Effects of Learning Bias. In *Proceedings of the Twenty-Fifth Conference on Artificial Intelligence (AAAI)*, San Francisco, CA, Aug 2011.
Acceptance rate: 25%

31. **J. W. Crandall***, M. L. Cummings, and *C. E. Nehme*. A Predictive Model for Human–Unmanned Vehicle Systems. *AIAA Journal of Aerospace Computing, Information, and Communication*, Vol. 6, No. 11, pp. 585-603, Nov 2009.
32. *C. E. Nehme*, *B. Mekdeci*, **J. W. Crandall**, and M. L. Cummings*. The Impact of Heterogeneity on Operator Performance in Futuristic Unmanned Vehicle Systems. *International C2 Journal, Special Issue: Representing Human Decision Making in Constructive Simulations for Analysis*, Vol. 2, No. 2, Dec 2008.
33. **J. W. Crandall*** and M. L. Cummings. Identifying Predictive Metrics for Supervisory Control of Multiple Robots. *IEEE Transactions on Robotics*, Vol. 23, No. 5, pp. 942-951, Oct 2007.
Journal Impact Factor: 4.036
34. *C. E. Nehme**, **J. W. Crandall**, and M. L. Cummings. An Operator Function Taxonomy for Unmanned Aerial Vehicle Missions. In *Proceedings of the 12th International Command and Control Research and Technology Symposium*, Newport, RI, Jun 2007.
35. **J. W. Crandall*** and M. L. Cummings. Developing Performance Metrics for the Supervisory Control of Multiple Robots. In *Proceedings of the Second ACM/IEEE International Conference on Human-Robot Interaction (HRI)*, Washington, DC, Mar 2007.
Acceptance rate: 22%
36. M. A. Goodrich*, T. W. McLain, J. Anderson, J. Sun, and **J. W. Crandall**. Managing Autonomy in Robot Teams: Observations from Four Experiments. In *Proceedings of the Second ACM/IEEE International Conference on Human-Robot Interaction (HRI)*, Washington, DC, Mar 2007.
Acceptance rate: 22%
37. M. L. Cummings*, *C. E. Nehme*, and **J. W. Crandall**. Predicting Operator Capacity for Supervisory Control of Multiple UAVs. In *Innovations Intelligent Machines*, Vol. 70, *Studies in Computational Intelligence*, J. S. Chahl, L. C. Jain, A. Mizutani, and M. Sato-Ilic, Eds., pp. 11-36, 2007.
38. **J. W. Crandall***, M. A. Goodrich, D. R. Olsen, and C. W. Nielsen. Validating Human-Robot Interaction Schemes in Multi-Tasking Environments. *IEEE Transactions on Systems, Man, and Cybernetics, Part A: Systems and Humans*, Vol. 35, No. 4, pp. 438-449, Jul 2005.
39. **J. W. Crandall*** and M. A. Goodrich. Learning to Compete, Compromise, and Cooperate in Repeated General-Sum Games. In *Proceedings of the Twenty-Second International Conference on Machine Learning (ICML)*, Bonn, Germany, Aug 2005.
Acceptance rate: 27%
40. **J. W. Crandall***, C. W. Nielsen, and M. A. Goodrich. Towards Predicting Robot Team Performance. In *Proceedings of the IEEE International Conference on Systems, Man, and Cybernetics*, Washington, D.C., Sep 2003.
41. **J. W. Crandall** and M. A. Goodrich*. Characterizing Efficiency of Human-Robot Interaction: A Case Study of Shared-Control Teleoperation. In *Proceedings of the IEEE/RSJ International Conference on Intelligent Robots and Systems*, Lausanne, Switzerland, Oct 2002.

42. **J. W. Crandall** and M. A. Goodrich*. Experiments in Adjustable Autonomy. In *Proceedings of the IEEE International Conference on Systems, Man, and Cybernetics*, Tuscan, AZ, Oct 2001.
43. M. A. Goodrich*, D. R. Olsen, **J. W. Crandall**, and T. J. Palmer. Experiments in Adjustable Autonomy. In *Proceedings of the IJCAI Workshop on Autonomy, Delegation, and Control: Interaction with Autonomous Agents*, Aug 2001.

Other Refereed Publications

44. A. Gautam, T. Whiting, X. Cao, M. A. Goodrich, and **J. W. Crandall**. A Method for Designing Autonomous Robots that Know Their Limits. *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA)*, 2022
45. A. Gautam*, **J. W. Crandall**, and M. A. Goodrich. Self-assessment of Proficiency of Intelligent Systems: Challenges and Opportunities. *International Conference on Applied Human Factors and Ergonomics (AHFE)*, 2020.
46. N. Mathema*, M. A. Goodrich, and **J. W. Crandall**. Predicting Plans and Actions in Two-Player Repeated Games. *AAAI 2020 Workshop on Plan, Activity, and Intent Recognition*, New York, NY, 2020.
47. **J. W. Crandall*** and H. Pham. Cooperating in Long-term Relationships with Time-Varying Structure. *Proceedings of the 18th International Conference on Autonomous Agents and Multi-agent Systems (AAMAS)*, Montreal, Canada, 2019. (Short paper)
Acceptance rate: 52%
48. C. C. Ashcraft, M. A. Goodrich, and **J. W. Crandall***. Moderating Operator Influence in Human-Swarm Systems. *Proceedings of the IEEE International Conference on Systems, Man, and Cybernetics (SMC)*, Bari, Italy, 2019
49. M. A. Goodrich*, **J. W. Crandall**, M. Oudah, and N. Mathema. Using Narrative to Enable Longitudinal Human-Robot Interactions, *Proceedings of the HRI2018 Workshop on Longitudinal Human-Robot Teaming*, Chicago, IL, 2018.
50. **J. W. Crandall***, N. Anderson, C. Ashcraft, H. Grosh, J. Henderson, J. McClellan, A. Neupane, and M. A. Goodrich. Human-Swarm Interaction as Shared Control: Achieving Flexible Fault-Tolerant Systems. In *Proceedings of the International Conference on Engineering Psychology and Cognitive Ergonomics*, Vancouver, CA, 2017.
51. S. V. Albrecht*, **J. W. Crandall**, and Subramanian Ramamoorthy. E-HBA: Using Action Policies for Expert Advice and Agent Typification. In *Proceedings of the AAAI-15 Workshop on Multiagent Interaction without Prior Coordination*, 2015.
52. **J. W. Crandall***. Learning in Real-Time in Repeated Games Using Experts. In *Proceedings of the Twelfth International Conference on Autonomous Agents and Multi-agent Systems (AAMAS)*, Minneapolis, MN, 2013. (short paper)
Acceptance rate: 44%
53. Y. Hassan* and **J. W. Crandall**. Genetic Algorithms in Repeated Matrix Games: The Effects of Algorithmic Modifications and Human Input with Various Associates. In *Proceedings of the IEEE Symposium on Intelligent Agents*, Singapore, 2013.

54. **J. W. Crandall***, M. H. Altakrori, and Y. M. Hassan. Learning by Demonstration in Repeated Stochastic Games. In *Proceedings of the Tenth International Conference on Autonomous Agents and Multi-agent Systems (AAMAS)*, Taipei, Taiwan, May 2011. (short paper)
Acceptance rate: 45%
55. M. A. Goodrich*, P. B. Sujit, B. Pendleton, **J. W. Crandall**, and J. Pinto. Toward Multi-Operator, Multi-Robot Teams: Human Interaction with Bio-Inspired Teams. In *Proceedings of the Tenth International Conference on Autonomous Agents and Multi-agent Systems (AAMAS)*, Taipei, Taiwan, May 2011. (short paper)
Acceptance rate: 45%
56. **J. W. Crandall***, M. A. Goodrich, and L. Lin. Encoding Intelligent Agents for Uncertain, Unknown, and Dynamic Tasks: From Programming to Interactive Artificial Learning. In *Proceedings of the AAAI Spring Symposium on Agents that Learn from Human Teachers*, Palo Alto, CA, Mar 2009.
57. M. L. Cummings*, P. Pina, **J. W. Crandall**. A Metric Taxonomy for Supervisory Control of Unmanned Vehicles. In *Proceedings of AUVSI's Unmanned Systems North America*, San Diego, CA, Jun 2008.
58. P. Pina*, M. L. Cummings, **J. W. Crandall**, and M. Della Pena. Identifying Generalizable Metric Classes to Evaluate Human-Robot Teams. In *Proceedings of the HRI Workshop on Metrics for Human-Robot Interaction*, Amsterdam, The Netherlands, Mar 2008.
59. *C. E. Nehme**, **J. W. Crandall**, and M. L. Cummings. Using Discrete-Event Simulation to Model Situational Awareness of Unmanned-Vehicle Operators. In *Proceedings of the ODU/VMASC Modeling, Simulation, and Gaming Student Capstone Conference*, Suffolk, VA, Apr 2008.
60. **J. W. Crandall*** and M. L. Cummings. Attention Allocation Efficiency in Human-UV Teams. In *Proceedings of the AIAA Infotech@Aerospace Conference and Exhibit*, Rohnert Park, May 2007.
61. **J. W. Crandall*** and M. A. Goodrich. Learning to Teach and Follow in Repeated Games. In *Proceedings of the AAAI Workshop on Multiagent Learning*, Pittsburgh, PA, Jul 2005.
62. **J. W. Crandall*** and M. A. Goodrich. Learning Near-Pareto Efficient Solutions With Minimal Knowledge Requirements Using Satisficing. In *Proceedings of the AAAI Fall Symposium on Artificial Multiagent Learning*, Washington, D.C., Oct 2004.
63. M. A. Goodrich*, E. R. Boer, **J. W. Crandall**, R. W. Ricks, and M. L. Quigley. Behavioral Entropy in Human-Robot Interaction. In *Proceedings of the Performance Metrics for Intelligent Systems Workshop (PERMIS)*, Gaithersburg, MD, Aug 2004.
64. **J. W. Crandall*** and M. A. Goodrich. Establishing Reputation Using Social Commitment in Repeated Games. In *Proceedings of the AAMAS Workshop on Learning and Evolution in Agent Based Systems*, New York City, NY, Jul 2004.
65. **J. W. Crandall*** and M. A. Goodrich. Multiagent Learning During On-Going Human-Machine Interactions: The Role of Reputation. In *Proceedings of the AAAI Spring Symposium on Interaction between Humans and Autonomous Systems over Extended Operation*, Palo Alto, CA, Mar 2004.

66. **J. W. Crandall*** and M. A. Goodrich. Measuring the Intelligence of a Robot and its Interface. In *Proceedings of the Performance Metrics for Intelligent Systems Workshop (PERMIS)*, Gaithersburg, MD, Sep 2003.
67. C. W. Nielsen*, M. A. Goodrich, and **J. W. Crandall**. Experiments in Human-Robot Teams. *Multi-Robot Systems: From Swarms to Intelligent Automata*, Vol. 2, Eds. Alan C. Shultz, Lynne E. Parker, Frank E. Schneider, Kluwer Academic Publishers. Washington, D.C., Mar 2003.
68. M. A. Goodrich*, **J. W. Crandall**, and J. R. Stimpson. Neglect Tolerant Teaming: Issues and Dilemmas. In *Proceedings of the AAAI Spring Symposium on Human Interaction with Autonomous Systems in Complex Environments*, Palo Alto, CA, Mar 2003.
69. **J. W. Crandall*** and M. A. Goodrich. Principles of Adjustable Interactions. In *Proceedings of the AAAI Fall Symposium on Human-Robot Interactions*, Cape Cod, MA, Nov 2002.

Theses

70. **J. W. Crandall**. Learning Successful Strategies in Repeated General-Sum Games. Ph.D. Dissertation, Brigham Young University, Dec 2005.
71. **J. W. Crandall**. Towards Developing Effective Human-Robot Systems. M.S. Thesis, Brigham Young University, Dec 2003.

Teaching

- Excellence in Teaching Award nominee, Masdar Institute: 2012, 2013, and 2015

Full Courses Taught

- CS235 – Data Structures, BYU
 - Semesters taught: Summer 2004, Fall 2016, Fall 2017 (2 sections), Fall 2018 (2 sections), Fall 2019 (2 sections), Fall 2020 (4 sections), Fall 2021 (2 sections), Fall 2022 (3 sections), Fall 2023 (2 sections)
 - Total students: 1,379
- CS470 – Introduction to Artificial Intelligence, BYU
 - Semesters taught: Fall 2016, Fall 2017, Fall 2018, Fall 2019, Winter 2022, Winter 2023, Spring 2023
 - Total students: 356
- CS501R – Human Interaction with Artificial Intelligence, BYU
 - Semesters taught: Winter 2018
 - Total students: 11
- CS601R – Social AI: Theories and Applications, BYU
 - Semesters taught: Winter 2019
 - Total students: 13
- CS670 – Multi-agent Systems, BYU
 - Semesters taught: Winter 2021
 - Total students: 13
- CIS503 & CIS603 – Multi-Agent Systems, Masdar Institute
 - Semesters taught: Fall 2010, Fall 2011, Fall 2012, Fall 2013, Fall 2014, Fall 2015
 - Total students: 135
- FDN 453 (CIS453) - Mathematics for Computer Science, Masdar Institute
 - Semesters taught: Fall 2010, Fall 2011, Fall 2012, Fall 2014, Fall 2015
 - Total students: 26
- CIS606 – Machine Learning, Masdar Institute (co-taught with Wei Lee Woon)
 - Semesters taught: Spring 2014
 - Total students: 11
- ITE502 – Principles of Computer Systems Engineering, Masdar Institute
 - Semesters taught: Fall 2009
 - Total students: 17

- 16.499 – Learning in Games, MIT
 - Semesters taught: Spring 2008
 - Total students: 18

Graduate Students Supervised (primary advisor)

Student	Degree	Date	Topic
Michael Richards	PhD–BYU	Current	Collective Action Autonomy
Ethan Pedersen	PhD–BYU	Current	Bandit Algorithms
Jonathan Skaggs	PhD–BYU	Current	Modeling Social Systems
Michael Richards	MS–BYU	Nov 2023	Modeling networks of agents/people
Ethan Pedersen	MS–BYU	Apr 2023	Bandit Algorithms
Jonathan Skaggs	MS–BYU	Jun 2022	Agent negotiation in repeated games
Tim Whiting	MS–BYU	Dec 2021	Human-machine cooperation
Brian James	MS–BYU	Aug 2021	Machine learning
Huy Pham	MS–BYU	Jun 2020	Learning in games
Chace Ashcraft	MS–BYU	Apr 2019	Managing robot collectives
Mayada Oudah	PhD–MI	Aug 2017	How machines win friends and influence people
Wael Al-Enezi	MS–MI	Jul 2016	Cooperation in dynamic games
Tennom	MS–MI	Jun 2015	Learning to cooperate with people
Abdulla Almehrzi	MS–MI	Sep 2014	Decision support for regulating machine societies
Alanoud Al Khemeiri	MS–MI	Dec 2014	Regulating autonomous machine societies
Rafael Harutyunyan	MS–MI	July 2013	Modeling strategic social interactions
Wen Shen	MS–MI	May 2013	Regulating autonomous machine societies
Vahagn Harutyunyan	MS–MI	Aug 2012	Cognitive telepresence in human-robot systems
Malik Altakrori	MS–MI	Dec 2011	Learning from demonstrations in strategic interactions
Yomna Mahmoud	MS–MI	Aug 2011	Learning from demonstrations in strategic interactions
Edmond Awad	MS–MI	Aug 2011	Learning in transportation systems
Asad Ahmed	MS–MI	Aug 2011	Multi-agent learning
Mehmet Ergun	MS–MI	Jul 2011	Adaptation in new-age power systems
Salman Ahmed	MS–MI	Jun 2011	Distance metric learning from demonstration
Vimitha Manohar	MS–MI	May 2011	Programming robots to express emotions

University Service

At BYU:

1. CS Advancement Committee (Aug 2023 – present)
2. CS Teaching Committee (Jul 2020 – present)
3. CS235 Curriculum Committee Chair (Aug 2017 – present)
4. CS Undergraduate Committee (Jul 2020 – Jun 2023)
5. CS Expectations Committee (Jul 2020 – July 2021)
6. CS Colloquium Chair (Jul 2018 – June 2020)
7. CS Faculty Search Committee (Aug 2019 – Jun 2020)
8. CS CHI Council (Aug 2016 – Jul 2018)
9. CS Department Undergraduate Committee (Aug 2016 – Jul 2018)
10. CS Faculty Representative for the student ACM group (Aug 2016 – Jul 2017)

At Masdar Institute:

1. EECS Faculty Recruitment and Advancement Committee (Nov 2015 – Aug 2016)
2. Human Subjects Research Ethics Committee (Aug 2011 – Aug 2016)
3. EECS Graduate Studies and Research Committee, Chair (Oct 2014 – Oct 2015)
4. EECS Curriculum Committee (Oct 2013 – Oct 2014)
5. CIS Program Effectiveness Committee (Feb 2013 – Oct 2013)
6. CIS Program Accreditation Lead (June 2012 – Sep 2013)
7. CIS Program Coordinator (Aug 2010 – Aug 2011)
8. CIS Faculty Search Committee (Fall 2009 – Sep 2013)
9. CIS Student MSc Admissions Committee (Jul 2008 – Sep 2013)
10. PhD Admissions Committee (Spring 2011 – Jun 2012)
11. Masdar Institute Seminar Series, Organizer (Fall 2010 – Spring 2011)
12. Library Committee (Spring 2010 – Aug 2010)
13. EE/EP Faculty Search Committee (Fall 2009 – Spring 2010)

Academic Service

Associate Editor, ACM Transactions on Human-Robot Interaction, Dec 2017 – April 2021

Senior Editor, Journal of Human-Robot Interaction, June 2015 – Dec 2017

NSF Panelist (2017, 2018, 2019, 2020, 2021; 5 panels total + 3 external reviews)

Journal Reviewing

Nature; Nature Communications; IEEE Transactions on Systems, Man, and Cybernetics – Parts A and B; Journal of Economic Dynamics and Control; Machine Learning; IEEE Intelligent Systems; Human Factors; Artificial Intelligence; IEEE Transactions on Robotics; Journal of Aerospace Computing, Information, and Communication; Intelligent Service Robots; Journal of Artificial Intelligence Research; Autonomous Agents and Multi-agent Systems; Journal of Machine Learning Research; Automatica; Journal of Human-Robot Interaction; IEEE Transactions on Human-Machine Systems; International Journal of Social Robotics; Swarm Intelligence, Robotics and Automation Letters

Conference Organization and Reviewing

- The Joint International Conference on Artificial Intelligence (IJCAI)
 - Program Committee: 2007, 2009, 2011, 2016, 2017, 2019-2024
 - Senior Program Committee: 2015
- The AAAI Conference on Artificial Intelligence (AAAI)
 - Area Chair: 2022-2024
 - Senior Program Committee: 2018, 2019
 - Program Committee: 2007, 2014, 2015, 2016, 2017, 2020
 - Student Abstract Program Committee: 2007, 2008
- The International Conference on Autonomous Agents and Multiagent Systems (AAMAS)
 - Program Committee: 2006 – 2009, 2011, 2014, 2023, 2024
 - Senior Program Committee: 2013, 2016
- The International Conference on Machine Learning (ICML)
 - Program Committee: 2012 – 2014, 2020
- The International Conference on Human-Robot Interaction (HRI)
 - Program Committee: 2008-2024
 - Video Session Co-Chair: 2010, 2011
 - Publication Co-Chair: 2012, 2013
 - Registration Co-Chair: 2015
- Robotics: Science, and Systems Conference (RSS)
 - Program Committee: 2007, 2008, 2011, 2012
 - RSS Pioneers Program Committee: 2019
- The International Conference on Robotics and Automation (ICRA)
 - Program Committee: 2007, 2011-2014
- The International Conference on Intelligent Robots and Systems (IROS)
 - Program Committee: 2008
 - Associate Editor: 2011
- Neural Information Processing Systems (NeurIPS)
 - Area Chair: 2020
 - Program Committee: 2008, 2018, 2019, 2021, 2022, 2023
- European Conference on Artificial Intelligence (ECAI)
 - Program Committee: 2023
- Other
 - Symposium Organizer: AAAI Spring Symposium 2022
 - Workshop Organizer: MIPC 2014 and 2015 at AAAI
 - Publicity Co-Chair: PRIMA 2012
 - PCs: LAMAS 2005, RO-MAN 2008, ICAART 2010, SMC 2010, SRR 2010, SMC 2019

Grants Awarded

Date	Topic, PIs, and Funding Agency	Amount (\$)
2021 – 2023	Autonomous Robots for Proficiency Self-Assessment Funding Agency: Office of Naval Research (DURIP) PIs: J. W. Crandall and M. A. Goodrich	113,000
2018 – 2024	SUCCESS: Self-assessment and understanding of competence and conditions to ensure system success Funding Agency: Office of Naval Research (MURI) PIs: With 6 other PIs from Carnegie Mellon, BYU, Tufts, Univ. of Massachusetts, Lowell (I am lead PI at BYU)	BYU's Portion: 1,795,409
2016 – 2019	Leveraging the power of hub-based colonies: Flexibility and efficiency through human-swarm interfaces Funding agency: Army Research Lab PIs: J. W. Crandall and M. A. Goodrich	99,129
2013 – 2016	Information and decision architectures for future power grids Funding agency: MI-MIT Flagship Research Program PIs: With 7 other PIs from Masdar Institute and MIT (I was lead PI at MI) Note: 12.5% of proposals awarded	MI's Portion: 999,570
2012 – 2013	Managing real-time interventions in smart buildings Funding agency: Siemens PIs: J. Crandall and I. Rahwan Note: Discontinued (Dec 2012) due to restructuring within Siemens	261,913
2011 – 2012	Supervisory control of a humanoid robot Funding agency: Masdar Institute (internal research grant) PIs: J. Crandall, W. Woon, and H. Ghedira	100,000
2010	Agent modeling for carbon markets Funding agency: Monash-Masdar Seed Fund PIs: M. Chetti and J. Crandall	9,888
2009 – 2011	Intelligent devices for smart power grids Funding agency: MIT-Masdar Institute Collaborative Program PIs: J. Crandall and M. Dahleh	400,000