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Education



- 2006 – 2012  **Ph.D., Computer Science and Engineering**
University of Michigan, Ann Arbor, MI.
Thesis: *Distributed Approaches for Solving Constraint-based Multiagent Scheduling Problems*
Ph.D. Advisor: *Edmund H. Durfee*
-  **M.Sc., Computer Science and Engineering**
University of Michigan, Ann Arbor, MI.
- 2002 – 2005  **B.Sc., Computer Science, Mathematics;**
Summa Cum Laude
Hope College, Holland, MI

Employment History

- 2021 –  **Csilla & Walt Foley Professor and Chair of Computer Science,**
- 2019 –  **Associate Professor of Computer Science,**
- 2014 – 2019  **Assistant Professor of Computer Science,**
- 2013 – 2014  **Visiting Assistant Professor of Computer Science,**
Computer Science Department, Harvey Mudd College, Claremont, CA.
- 2019 – 2022  **Consultant,**
Advisor for Earth-Observing Satellite Scheduling Algorithm Development
AI Group, Jet Propulsion Laboratory, Pasadena, CA.
- 2012 – 2013  **Postdoctoral Associate,**
Computer Science and AI Laboratory, Supervisor: Julie Shah,
Massachusetts Institute of Technology, Cambridge, MA.
- 2007 – 2012  **Graduate Student Research Assistant,**
Computer Science Department, Advisor: Edmund H. Durfee,
University of Michigan, Ann Arbor, MI.







Grant Activity

National Science Foundation








-  1 DUE-1946637, “A consortium for cultivating future artificial intelligence researchers,” in *NSF—Improving Undergraduate STEM Education, Division of Undergraduate Education*, \$45,900 USD, 2020–2023.
-  2 IIS-1651822, “Career: Robust and reliable multiagent scheduling under uncertainty,” in *NSF—Information & Intelligent Systems, Computer and Information Science and Engineering*, \$495,499.00 USD, 2017–2024.














Research Publications

Journal Articles










- 1 S. Akmal, S. Ammons, H. Li, M. Gao, L. Popowski, and **J. C. Boerkoel**, “Quantifying controllability in temporal networks with uncertainty,” *Artificial Intelligence*, vol. 289, p. 103 384, 2020, issn: 0004-3702.  DOI: 10.1016/j.artint.2020.103384.
- 2 V. V. Unhelkar, S. Dörr, A. Bubeck, P. A. Lasota, J. Perez, H. C. Siu, **J. C. Boerkoel**, Q. Tyroller, J. Bix, S. Bartscher, and J. A. Shah, “Mobile robots for moving-floor assembly lines: Design, evaluation, and deployment,” *IEEE Robotics & Automation Magazine*, vol. 25, no. 2, pp. 72–81, 2018.  DOI: 10.1109/MRA.2018.2815639.
- 3 D. Fisher, C. Isbell, M. L. Littman, M. Wollowski, T. W. Neller, and **J. Boerkoel**, “Ask me anything about moocs,” *AI Magazine*, vol. 38, no. 2, pp. 7–12, Jul. 2017.  DOI: 10.1609/aimag.v38i2.2729.
- 4 M. Wollowski, T. Neller, and **J. Boerkoel**, “Artificial intelligence education: Editorial introduction,” *AI Magazine*, vol. 38, no. 2, pp. 5–6, Jul. 2017.  DOI: 10.1609/aimag.v38i2.2728.
- 5 E. H. Durfee, **J. C. Boerkoel**, and J. Sleight, “Using hybrid scheduling for the semi-autonomous formation of expert teams,” *Future Generation Computer Systems*, vol. 31, pp. 200–212, 2014, Special Section: Advances in Computer Supported Collaboration: Systems and Technologies, issn: 0167-739X.  DOI: 10.1016/j.future.2013.04.008.
- 6 **J. C. Boerkoel** and E. H. Durfee, “Distributed reasoning for multiagent simple temporal problems,” *Journal of Artificial Intelligence Research*, vol. 47, pp. 95–156, 2013.  DOI: 10.1613/jair.3840.


Highly-Refereed Conference Proceedings




- 1 **J. Boerkoel** and M. Ergezer, “An undergraduate consortium for addressing the leaky pipeline to computing research,” in *Proceedings of the 54th ACM Technical Symposium on Computer Science Education V. 1*, ser. SIGCSE 2023, Toronto ON, Canada: Association for Computing Machinery, 2023, pp. 687–693, ISBN: 9781450394314.  DOI: 10.1145/3545945.3569841.
- 2 R. Chen, Y. Ma, S. Wu, and **J. C. Boerkoel Jr.**, “Sensitivity analysis for dynamic control of pstns with skewed distributions,” in *Proceedings of the International Conference on Automated Planning and Scheduling*, vol. 33, Jul. 2023, pp. 95–99.  DOI: 10.1609/icaps.v33i1.27183.
- 3 M. Morgan, J. Schalkwyk, H. Wang, H. Davalos, R. Martinez, V. Rohilla, and **J. Boerkoel**, “Simple temporal networks for improvisational teamwork,” in *Proceedings of the International Conference on Automated Planning and Scheduling*, vol. 32, Jun. 2022, pp. 261–269.  DOI: 10.1609/icaps.v33i1.27183.
- 4 M. Gao, L. Popowski, and **J. Boerkoel**, “Dynamic control of probabilistic simple temporal networks,” in *Proceedings of the AAAI Conference on Artificial Intelligence*, vol. 34, Apr. 2020, pp. 9851–9858.  DOI: 10.1609/aaai.v34i06.6538.
- 5 J. R. Abrahams, D. A. Chu, G. Diehl, M. Knittel, J. Lin, W. Lloyd, **J. C. Boerkoel**, and J. Frank, “Dream: An algorithm for mitigating the overhead of robust rescheduling,” in *Proc. of the 29th International Conference on Automated Planning and Scheduling (ICAPS-19)*, 2019, pp. 3–12.  DOI: 10.1609/icaps.v29i1.3454.
- 6 S. Akmal, S. Ammons, H. Li, and **J. C. Boerkoel**, “Quantifying degrees of controllability in temporal networks with uncertainty,” in *Proc. of the 29th International Conference on Automated Planning and Scheduling (ICAPS-19)*, Awarded Best Student Paper (Runner up), 2019, pp. 22–30.  DOI: 10.1609/icaps.v29i1.3456.
- 7 J. Y. Lee, V. Ojha, and **J. C. Boerkoel**, “Measuring and optimizing durability against scheduling disturbances,” in *Proc. of the 29th International Conference on Automated Planning and Scheduling (ICAPS-19)*, 2019, pp. 264–268.  DOI: 10.1609/icaps.v29i1.3486.

- 8 A. Huang, L. Lloyd, M. Omar, and **J. Boerkoel**, “New perspectives on flexibility in simple temporal planning,” in *Proc. of the 28th International Conference on Automated Planning and Scheduling (ICAPS-18)*, 2018, pp. 123–131.  DOI: 10.1609/icaps.v28i1.13907.
- 9 K. Lund, S. Dietrich, S. Chow, and **J. Boerkoel**, “Robust execution of probabilistic temporal plans,” in *Proc. of the 31st National Conference on Artificial Intelligence (AAAI-17)*, 2017, pp. 3597–3604.  DOI: 10.1609/aaai.v31i1.11019.
- 10 J. Brooks, E. Reed, A. Gruver, and **J. C. Boerkoel**, “Robustness in probabilistic temporal planning,” in *Proceedings of the Twenty-Ninth AAAI Conference on Artificial Intelligence (AAAI-15)*, 2015, pp. 3239–3246.  URL: <https://dl.acm.org/doi/10.5555/2888116.2888167>.
- 11 P. L. Donti, H. Rosenbloom, A. Gruver, and **J. C. Boerkoel**, “Predicting the quality of user experiences to improve productivity and wellness,” in *Proceedings of the Twenty-Ninth AAAI Conference on Artificial Intelligence*, 2015, pp. 4154–4155.  DOI: <https://doi.org/10.1609/aaai.v29i1.9740>.
- 12 V. V. Unhelkar, J. Perez, **J. C. Boerkoel**, J. Bix, S. Bartscher, J. Shah, *et al.*, “Towards control and sensing for an autonomous mobile robotic assistant navigating assembly lines,” in *Proceedings of the 2014 IEEE International Conference on Robotics and Automation (ICRA)*, IEEE, 2014, pp. 4161–4167.  DOI: 10.1109/ICRA.2014.6907464.
- 13 **J. C. Boerkoel** and E. H. Durfee, “Decoupling the multiagent disjunctive temporal problem,” in *Twenty-Seventh AAAI Conference on Artificial Intelligence*, 2013, pp. 123–129.  URL: <https://dl.acm.org/doi/abs/10.5555/2484920.2485113>.
- 14 **J. C. Boerkoel**, L. Planken, R. Wilcox, and J. A. Shah, “Distributed algorithms for incrementally maintaining multiagent simple temporal networks,” in *Proceedings of the 23rd International Conference on Automated Planning and Scheduling (ICAPS)*, 2013, pp. 11–19.  URL: <https://dl.acm.org/doi/10.5555/3038718.3038721>.
- 15 **J. C. Boerkoel** and E. H. Durfee, “A distributed approach to summarizing spaces of multiagent schedules,” in *Proceedings of the Twenty-Sixth AAAI Conference on Artificial Intelligence*, 2012, pp. 1742–1748.  URL: <https://dl.acm.org/doi/10.5555/2566972.2566976>.
- 16 **J. C. Boerkoel** and E. H. Durfee, “Distributed algorithms for solving the multiagent temporal decoupling problem,” in *The 10th International Conference on Autonomous Agents and Multiagent Systems - Volume 1*, ser. AAMAS ’11, Taipei, Taiwan: International Foundation for Autonomous Agents and Multiagent Systems, 2011, pp. 141–148, ISBN: 0982657153.  URL: <https://dl.acm.org/doi/abs/10.5555/2030470.2030491>.
- 17 **J. C. Boerkoel**, E. H. Durfee, and K. Purrington, “Generalized solution techniques for preference-based constrained optimization with cp-nets,” in *Proceedings of the 9th International Conference on Autonomous Agents and Multiagent Systems: volume 1-Volume 1*, 2010, pp. 291–298.  URL: <https://dl.acm.org/doi/abs/10.5555/1838206.1838247>.
- 18 **J. C. Boerkoel** and E. H. Durfee, “A comparison of algorithms for solving the multiagent simple temporal problem,” in *Proceedings of the Twentieth International Conference on International Conference on Automated Planning and Scheduling*, ser. ICAPS’10, Toronto, Ontario, Canada: AAAI Press, 2010, pp. 26–33.  URL: <https://dl.acm.org/doi/10.5555/3037334.3037339>.
- 19 **J. C. Boerkoel** and E. H. Durfee, “Evaluating hybrid constraint tightening for scheduling agents,” in *Proceedings of The 8th International Conference on Autonomous Agents and Multiagent Systems-Volume 1*, 2009, pp. 673–680.  URL: <https://dl.acm.org/doi/pdf/10.5555/1558013.1558106>.
- 20 **J. C. Boerkoel** and E. H. Durfee, “Hybrid constraint tightening for solving hybrid scheduling problems,” in *Proceedings of the 23rd National Conference on Artificial Intelligence - Volume 3*, ser. AAAI’08, Chicago, Illinois: AAAI Press, 2008, pp. 1446–1449, ISBN: 9781577353683.  URL: <https://dl.acm.org/doi/abs/10.5555/1620270.1620301>.

Refereed Workshops and Symposia

- 1 E. Weiss, Z. Jacotin, R. B. Jackson, A. Yuan, and **J. C. Boerkoel**, “Analyzing the fluency of human-robot interactions,” in *In the Proceedings of the AAAI 2023 Spring Symposium Series on HRI in Academia and Industry: Bridging the Gap*, 2023.  URL:
https://rbjackson.github.io/paper_pdfs/weiss2023analyzing.pdf.
- 2 M. Morgan, J. Schalkwyk, H. Wang, H. Davalos, R. Martinez, V. Rohilla, and **J. Boerkoel**, “Simple temporal networks for improvisational teamwork,” in *In the Proceedings of the AAAI 2022 Spring Symposium Series on ‘Can We Talk?’ How to Design Multi-Agent Systems In the Absence of Reliable Communications*, 2022.
- 3 **J. Boerkoel**, J. Mason, D. Wang, S. Chien, and A. Maillard, “An efficient approach for scheduling imaging tasks across a fleet of satellites,” in *Proceedings of 2021 International Workshop on Planning & Scheduling for Space (IWPSS 21)*, 2021.  URL:
<https://ai.jpl.nasa.gov/public/documents/papers/Boerkoel-IWPSS2021-paper-23.pdf>.
- 4 M. Abo Dominguez, W. La, and **J. Boerkoel**, “Modeling human temporal uncertainty in human-agent teams,” in *In Proc. of Artificial Intelligence in Human Robot Interaction AAAI Fall Symposium Series (AI-HRI 2020)*, 2020.  DOI: 10.48550/arXiv.2010.04849.
- 5 S. Chien, **J. Boerkoel**, J. Mason, D. Wang, A. Davies, J. Mueting, V. Vittaldev, V. Shah, and I. Zuleta, “Leveraging space and ground assets in A sensorweb for scientific monitoring: Early results and opportunities for the future,” in *IEEE International Geoscience and Remote Sensing Symposium, IGARSS 2020, Waikoloa, HI, USA, September 26 - October 2, 2020*, IEEE, 2020, pp. 3833–3836.  DOI:
10.1109/IGARSS39084.2020.9324049.
- 6 S. A. Chien, **J. Boerkoel**, J. Mason, D. Wang, A. G. Davies, J. Mueting, V. Vittaldev, V. Shah, and I. Zuleta, “Space ground sensorwebs for volcano monitoring,” in *The International Symposium on Artificial Intelligence, Robotics and Automation in Space*, 2020.  URL:
<https://www.hou.usra.edu/meetings/isairas2020fullpapers/pdf/5004.pdf>.
- 7 S. Isaacson, G. Rice, and **J. C. Boerkoel**, “Mad-tn: A tool for measuring fluency in human-robot collaboration,” in *In Proceedings of Artificial Intelligence in Human-Robot Interaction AAAI Fall Symposium Series (AI-HRI 2019)*, 2019.  DOI: 10.48550/arXiv.1909.06675.
- 8 D. Chu Lasso, G. Diehl, M. Knittel, J. Lin, W. Lloyd, **J. C. Boerkoel**, and J. Frank, “Trade-offs between communication, rescheduling, and success rate in uncertain multi-agent schedules,” in *In Proc. of the ICAPS 2018 on Integrated Planning, Acting and Execution (InTex 2018)*, 2018.  URL:
<https://icaps18.icaps-conference.org/fileadmin/algorithms/conferences/icaps18/workshops/workshop09/docs/proceedings.pdf>.
- 9 B. Castro, M. Roberts, K. Mena, and **J. Boerkoel**, “Who takes the lead? automated scheduling for human-robot teams,” in *In Proc. of Technical Report of the Artificial Intelligence in Human-Robot Interaction AAAI Fall Symposium Series (AI-HRI 2017)*, 2017.  URL:
<https://cdn.aaai.org/ocs/15964/15964-69861-1-PB.pdf>.
- 10 K. Lund, S. Dietrich, and **J. C. Boerkoel**, “Robust multi-robot scheduling,” in *In Proc. of the 2016 Robotics: Science and Systems Conference (RSS 2016) Workshop on On-line decision-making in multi-robot coordination (DERMUR-16)*, 2016.  URL:
<https://robotics.fel.cvut.cz/demur16/files/demur16-lund-dietrich-boerkoel.pdf>.
- 11 J. Wu, E. Paeng, and **J. C. Boerkoel**, “Exploring human-robot trust and cooperation,” in *In Proc. of the 2016 Robotics: Science and Systems Conference (RSS 2016) Workshop on Social Trust in Autonomous Robots*, 2016.
- 12 J. Wu, E. Paeng, K. Linder, P. Valdesolo, and **J. C. Boerkoel**, “Trust and cooperation in human-robot decision making,” in *In Technical Report of The 2016 AAAI Fall Symposium Series (FS-16-01): Artificial*


Intelligence for Human-Robot Interaction (AI-HRI 2016), 2016.  URL: <https://aaai.org/papers/14118-14118-trust-and-cooperation-in-human-robot-decision-making/>.

- 13 P. L. Donti and **J. C. Boerkoel**, “Exploring active and passive team-based coordination,” in *Proceedings of the 2014 AAAI Fall Symposium Series*, 2014, pp. 62–64.  URL: <https://cdn.aaai.org/ocs/9112/9112-40056-1-PB.pdf>.
- 14 **J. C. Boerkoel** and L. Planken, “Distributed algorithms for incrementally maintaining multiagent simple temporal networks,” in *Proceedings of the AAMAS 2012 Workshop on Autonomous Robots and Multirobot Systems (ARMS) 2012*, 2012.
- 15 **J. C. Boerkoel** and E. H. Durfee, “Challenges in maintaining minimal, decomposable disjunctive temporal problems,” 2011.  URL: <https://www.sfbtr8.spatial-cognition.de/ailog-2011/ailog-downloads/2011/AIlog-2011-Proceedings.pdf#page=13>.
- 16 E. H. Durfee, **J. C. Boerkoel**, and J. Sleight, “Comparing techniques for the semi-autonomous formation of expert teams,” in *2011 International Conference on Collaboration Technologies and Systems (CTS) Workshop on Multi-Agent Systems and Collaborative Technologies (I-MASC11)*, IEEE, 2011, pp. 351–358.  DOI: 10.1109/CTS.2011.5928710.

Posters, Panels, and other Proceedings

- 1 **J. C. Boerkoel**, M. Ergezer, C. Alvarado, and V. Tayloar, “Expanding computing research pathways (panel),” in *The Conference on Research in Equity and Sustained Participation in Engineering, Computing, and Technology (RESPECT)*, 2022.
- 2 K. Lund, S. Dietrich, and **J. C. Boerkoel**, “Robust execution strategies for probabilistic temporal planning (student abstract),” in *AAAI-2016 Student Abstract and Poster Program*, 2016.
- 3 E. Paeng, J. Wu, and **J. C. Boerkoel**, “Exploring human-robot trust and cooperation (student abstract),” in *AAAI-2016 Student Abstract and Poster Program*, 2016.
- 4 P. Donti, H. Rosenbloom, A. Gruver, and **J. C. Boerkoel**, “Predicting the quality of user experiences to improve productivity and wellness (student abstract),” in *AAAI-2015 Student Abstract and Poster Program*, 2015.
- 5 **J. C. Boerkoel** and E. H. Durfee, “Decoupling the multiagent disjunctive temporal problem (extended abstract),” in *Proceedings of the 9th International Conference on Autonomous Agents and Multiagent Systems (AAMAS 2013)*, 2013, pp. 123–129.
- 6 **J. C. Boerkoel** and J. A. Shah, “Planning for flexible human-robot co-navigation in dynamic manufacturing environments,” in *Proceedings of Pioneers Workshop at the International Conference on Human-Robot Interaction (HRI)*, 2013.
- 7 **J. C. Boerkoel**, “Solving the multiagent selection and scheduling problem,” in *International Joint Conferences on Artificial Intelligence Doctoral Consortium*, 2011.
- 8 **J. C. Boerkoel** and E. H. Durfee, “Partitioning the multiagent simple temporal problem for concurrency and privacy,” in *Proceedings of the 9th International Conference on Autonomous Agents and Multiagent Systems*, 2010, pp. 1421–1422.

Patents

- 1 S. H. Adachi, T. J. Adair, **J. C. Boerkoel**, T. W. Brent, D. S. Campbell, T. W. Lynn, and J. R. Ornstein, “Heuristic graph embedding methods for adiabatic quantum computation optimization,” US Patent 10,282,674, May 2019.  URL: <https://patents.google.com/patent/US10282674B2>.