

# CURRICULUM VITAE

## James C. Lester

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### Professional Experience

- 2012-present **Distinguished Professor**, Computer Science, North Carolina State University.
- 2012-present **Founding Director**, Center for Educational Informatics, North Carolina State University.
- 2009-2012 **Professor**, Computer Science, North Carolina State University.
- 2000-2006 **Chief Scientist**, LiveWire Logic, Inc.
- 1999-2009 **Associate Professor**, Computer Science, North Carolina State University.
- 1994-1999 **Assistant Professor**, Computer Science, North Carolina State University.

### Education

- 1994 **Ph.D.**, Computer Science, University of Texas at Austin.
- 1988 **M.S.C.S.**, Computer Science, University of Texas at Austin.
- 1986 **B.A.**, Computer Science, University of Texas at Austin.  
Highest Honors, Phi Beta Kappa.
- 1983 **B.A.**, History, Baylor University.  
Honors Program with Distinction.

### Research Interests

ARTIFICIAL INTELLIGENCE, ADVANCED LEARNING TECHNOLOGIES, EDUCATION

- ARTIFICIAL INTELLIGENCE: AI & education, AI & digital games, AI & training, affective computing, computational models of narrative, intelligent user interfaces, intelligent virtual agents, natural language processing, multimodal interaction, user modeling.
- ADVANCED LEARNING TECHNOLOGIES: Adaptive learning environments, game-based learning environments, intelligent tutoring systems, pedagogical agents, natural language tutorial dialogue, learning analytics.
- EDUCATION: K-12 science education, computer science education, informal science education, affect, self-regulated learning.

### Honors and Awards

- IFAAMAS Influential Paper Award, International Foundation for Autonomous Agents and Multiagent Systems, 2017.

IFAAMAS Award Citation: "This paper was instrumental in beginning a field, it influenced other areas and disciplines (AI in Education, Virtual Agents), and it continues to be relevant many years later."

- TICL Outstanding International Research Collaboration Award, American Educational Research Association, *Technology, Instruction, Cognition, & Learning SIG*, 2017.
- Best Paper Award, Twenty-Third Conference on User Modeling, Adaptation, and Personalization, 2015.
- AAAI Fellow, Association for the Advancement of Artificial Intelligence, 2014.  
AAAI Fellow Citation: “For significant and sustained contributions to artificial intelligence technologies for education.”
- James Chen Best Student Paper Award, Twenty-First Conference on User Modeling, Adaptation and Personalization, 2013.
- Best Paper Award, Seventh AAAI International Conference on Artificial Intelligence and Interactive Digital Entertainment, 2011.
- Best Student Paper Award, International Conference on Affective Computing & Intelligent Interaction, 2009.
- Best Student Paper Award, Thirteenth International Conference on Artificial Intelligence in Education, 2007.
- Outstanding Paper Award, Twelfth World Conference on Educational Multimedia, Hypermedia, and Telecommunications, 2000.
- Best Paper Award, ACM International Conference on Intelligent User Interfaces, 1999.
- ACM Recognition of Service Award, Association for Computing Machinery, 1999.
- North Carolina State University Academy of Outstanding Teachers, 1998-present.
- North Carolina State University Outstanding Teacher Award, 1998.
- Best Paper Award, Eighth World Conference on Artificial Intelligence in Education, 1997.
- NSF CAREER Award, National Science Foundation, 1997.
- Outstanding New Teacher Award, Dept. of Computer Science, North Carolina State University, 1995.
- Artificial Intelligence Laboratory Doctoral Fellowship, University of Texas at Austin, 1986.

## Professional Societies

- Association for Advancement of Artificial Intelligence (AAAI).
- Association for Computing Machinery (ACM).
- American Educational Research Association (AERA).
- International Artificial Intelligence in Education Society (IAIED).
- Institute of Electrical and Electronics Engineers (IEEE).

## Sponsored Research Activity

- National Science Foundation (Future of Work at the Human-Technology Frontier: Advancing Cognitive and Physical Capabilities Program)  
Project: *Augmented Cognition for Teaching: Transforming Teacher Work with Intelligent Cognitive Assistants*, 2018-2022.  
Role: Principal Investigator. (Co-PI: B. Mott.)  
Multi-PI Collaborative Project:  
Collaborating Institution: Indiana University.  
Collaborating PI: K. Glazewski.

Total Award: \$2,999,721.  
Award: \$1,499,736.

- National Science Foundation (EHR Core Research Program)  
Project: *Supporting Student Planning with Open Learner Models in Middle Grades Science*, 2018-2021.  
Role: Principal Investigator. (Co-PI: R. Azevedo.)  
Award: \$1,499,183.
- National Institute of Standards and Technology (Public Safety Innovation Accelerator Program)  
Project: *Investigating Emergency Response Performance with VR-Based Intelligent User Interfaces*, 2018-2020.  
Role: Principal Investigator. (Co-PIs: B. Mott, R. Spain.)  
Award: \$1,112,175.
- National Science Foundation (Advancing Informal STEM Learning Program)  
Project: *Multimodal Visitor Analytics: Investigating Naturalistic Engagement with Interactive Tabletop Science Exhibits*, 2018-2021.  
Role: Principal Investigator. (Co-PIs: J. Minogue, J. Rowe.)  
Award: \$1,951,956.
- U.S. Army Research Laboratory  
Project: *DeepGen: Dynamic Generation of Training Simulation Scenarios with Deep Reinforcement Learning*, 2017-2021.  
Role: Principal Investigator. (Co-PIs: B. Mott, J. Rowe.)  
Award: \$360,857.
- National Institutes of Health (National Institute of General Medical Sciences, Science Education Partnership Award)  
Project: *Health Quest: Engaging Adolescents in Health Careers with Technology-Rich Personalized Learning*, 2017-2022.  
Role: Principal Investigator. (Co-PI: E. Ozer.)  
Award: \$1,301,820.
- National Science Foundation (EHR Core Research Program)  
Project: *REFLECT: Improving Science Problem Solving with Adaptive Game-Based Reflection Tools*, 2017-2020.  
Role: Principal Investigator. (Co-PI: R. Azevedo.)  
Award: \$1,300,000.
- National Science Foundation (EHR Core Research Program)  
Project: *Big Data from Small Groups: Learning Analytics and Adaptive Support in Game-based Collaborative Learning*, 2016-2021.  
Role: Principal Investigator.  
Multi-PI Collaborative Project:  
Collaborating Institution: Indiana University.  
Collaborating PI: C. Hmelo-Silver.  
Total Award: \$2,484,146.  
Award: \$1,249,611.
- National Science Foundation (Improving Undergraduate STEM Education Program)  
Project: *PRIME: Engaging STEM Undergraduate Students in Computer Science with Intelligent Tutoring Systems*, 2016-2020.  
Role: Principal Investigator. (Co-PIs: B. Mott, E. Wiebe.)  
Multi-PI Collaborative Project:  
Collaborating Institution: University of Florida.  
Collaborating PI: K. Boyer.  
Total Award: \$1,999,707.  
Award: \$1,499,828.
- National Science Foundation (STEM + Computing Partnerships Program)

Project: *ENGAGE: A Game-based Curricular Strategy for Infusing Computational Thinking into Middle School Science*, 2016-2019.

Role: Principal Investigator. (Co-PIs: D. Blackburn, K. Boyer, B. Mott, E. Wiebe.)

Award: \$2,498,862.

- National Science Foundation (Discovery Research K-12 Program)  
Project: *Guiding Understanding via Information from Digital Environments (GUIDE)*, 2015-2019.  
Role: Co-principal Investigator & Subcontractor (Co-PIs: F. Reichsman, E. Wiebe.)  
Prime Institution: The Concord Consortium.  
PI: C. Dorsey.  
Total Award: \$2,983,810.  
Award: \$1,238,549.
- U.S. Army Research Laboratory  
Project: *Tutorial Planning with Markov Decision Processes for Counterinsurgency Training Environments*, 2015-2018.  
Role: Principal Investigator. (Co-PIs: B. Mott, J. Rowe.)  
Award: \$1,072,237.
- National Science Foundation (Cyber-Human Systems Program)  
Project: *Adapting to Affect in Multimodal Dialogue-Rich Interaction with Middle School Students*, 2014-2017.  
Role: Principal Investigator. (Co-PIs: K. Boyer, B. Mott, E. Wiebe.)  
Award: \$1,200,073.
- SAS Institute, Inc.  
Project: *Using Deep Learning to Build Context-Sensitive Language Models*, 2014-2015.  
Role: Principal Investigator. (Co-PI: B. Mott.)  
Award: \$272,839.
- National Science Foundation (EHR Core Research Program)  
Project: *The Effectiveness of Intelligent Virtual Humans in Facilitating Self-Regulated Learning in STEM with MetaTutor*, 2014-2017.  
Role: Co-principal Investigator. (PI: R. Azevedo.)  
Award: \$1,365,603.
- National Science Foundation (Smart and Connected Health Program)  
Project: *A Self-Adaptive Personalized Behavior Change System for Adolescent Preventive Healthcare*, 2013-2017.  
Role: Principal Investigator.  
Multi-PI Collaborative Project:  
Collaborating Institution: University of California – San Francisco.  
Collaborating PI: E. Ozer.  
Total Award: \$2,011,991.  
Award: \$968,818.
- Social Sciences and Humanities Research Council of Canada  
Project: *Learning Environments Across Disciplines (LEADS): Supporting Technology Rich Learning Across Disciplines*, 2012-2014.  
Role: Subcontractor  
Prime Institution: McGill University.  
PI: S. Lajoie.  
Award: \$46,970.
- U.S. Army Research Laboratory  
Project: *Detection and Transition Analysis of Engagement and Affect in a Simulation-Based Combat Medic Training Environment*, 2012-2015.  
Role: Subcontractor  
Prime Institution: Columbia University.  
PI: R. Baker.  
Award: \$478,592.

- National Science Foundation (Computing Education for the 21<sup>st</sup> Century Program)  
Project: *ENGAGE: Immersive Game-Based Learning for Middle Grade Computational Fluency*, 2012-2014.  
Role: Principal Investigator. (Co-PIs: K. Boyer, B. Mott, E. Wiebe.)  
Award: \$1,047,996.
- National Science Foundation (Informal Science Education Program)  
Project: *Investigating An Intelligent Cyberlearning System For Interactive Museum-based Sustainability Modeling*, 2011-2013.  
Role: Principal Investigator. (Co-PIs: P. FitzGerald, J. Minogue, B. Mott.)  
Award: \$713,384.
- Bill & Melinda Gates Foundation, William and Flora Hewlett Foundation, and EDUCAUSE  
Project: *Promoting Literacy Education in Rural Schools with Intelligent Game-Based Learning Environments*, 2011-2012.  
Role: Principal Investigator. (Co-PIs: C. Brown, R. Conner, E. Hodge, B. Mott, M. Wirth.)  
Award: \$498,783.
- National Science Foundation (Research & Evaluation on Education in Science & Engineering Program)  
Project: *An Integrated Model of Cognitive and Affective Scaffolding for Intelligent Tutoring Systems*, 2010-2013.  
Role: Principal Investigator. (Co-PIs: K. Boyer, E. Wiebe.)  
Award: \$1,542,275.
- National Science Foundation (Discovery Research K-12 Program)  
Project: *The LEONARDO Project: An Intelligent Cyberlearning System for Interactive Scientific Modeling in Elementary Science Education*, 2010-2014.  
Role: Principal Investigator. (Co-PIs: M. Carter, B. Mott, E. Wiebe.)  
Award: \$3,499,410.
- DARPA  
Project: *JOUST: Justification for Objectives Using Spoken Text*, 2009-2010.  
Role: Subcontractor  
Prime Institution: University of Rochester.  
PI: J. Allen.  
Award: \$60,000.
- National Science Foundation (CreativeIT Program)  
Project: *The Narrative Theatre: A Creativity Enhancing Environment*, 2008-2011.  
Role: Principal Investigator. (Co-PI: H. Spires.)  
Award: \$828,868.
- National Science Foundation (Human-Centered Computing Program)  
Project: *Modeling Student Affect in Game-Based Learning Environments*, 2008-2011.  
Role: Principal Investigator.  
Award: \$480,422.
- National Science Foundation (Discovery Research K-12 Program)  
Project: *Developing Science Problem-Solving Skills and Engagement Through Intelligent Game-Based Learning Environments*, 2008-2012.  
Role: Principal Investigator. (Co-PIs: J. Minogue, J. Nietfeld, H. Spires.)  
Award: \$2,523,297.
- National Science Foundation (Advanced Learning Technologies Program)  
Project: *Bayesian Pedagogical Agents for Dynamic High-Performance Inquiry-Based Learning Environments*, 2007-2009.  
Role: Principal Investigator. (Co-PIs: J. Nietfeld, H. Spires.)  
Award: \$605,436.
- National Science Foundation (Research on Education, Policy, and Practice Program)

Project: *Self-Explaining Learning Environments*, 1999-2002.

Role: Principal Investigator. (Co-PI: P. FitzGerald.)

Award: \$645,750.

- National Science Foundation (Learning & Intelligent Systems Program)  
Project: *Animated Pedagogical Agents for Constructivist Learning Environments*, 1997-2000.  
Role: Principal Investigator. (Co-PIs: S. Converse, P. FitzGerald, R. Mayer, H. Spires.)  
Award: \$600,472.
- National Science Foundation (Interactive Systems Program – NSF CAREER Award)  
Project: *Multimedia Explanation Generators for Knowledge-Based Learning Environments*, 1997-2001.  
Role: Principal Investigator.  
Award: \$390,373.
- Novell, Inc.  
Project: *Intelligent Agent Technologies*, 1996.  
Role: Principal Investigator.  
Award: \$25,000.
- National Science Foundation (Division of Undergraduate Education)  
Project: *A Laboratory for Teaching Multimedia Technology for Computer Science Majors*, 1995-1997.  
Role: Co-principal Investigator. (PI: D. Reeves.)  
Award: \$52,100.

## Research Supervision

### Post-Doctoral Scholars Supervised

- Wookhee Min, 2016-2018.
- Joseph Grafsgaard (Co-supervisor: K. Boyer), 2014-2015.
- Eun Ha, 2011-2014.
- Kristy Boyer, 2010-2011.
- Lisong Xu, 2002-2003.
- Charles Callaway, 2000-2001.

### Doctoral Students Supervised

- Pengcheng Wang, *Deep Reinforcement Learning for Interactive Narrative Planning*, 2018.
- Wookhee Min, *Generalized Goal Recognition Framework for Open-World Digital Games*, 2016.
- Samuel Leeman-Munk, *Morphosyntactic Neural Analysis for Generalized Lexical Normalization*, 2016.
- Joseph Grafsgaard (Co-advisor: Kristy Boyer), *Multimodal Affect Modeling in Task-Oriented Tutorial Dialogue*, 2014.
- Alok Baikadi, *Discovery-based Goal Recognition in Interactive Narrative Environments*, 2014.
- Jennifer Sabourin, *Stealth Assessment of Self-Regulated Learning in Game-Based Learning Environments*, 2013.
- Jonathan Rowe, *Narrative-Centered Tutorial Planning with Concurrent Markov Decision Processes*, 2013.
- Julius Goth, *Intrasentential Grammatical Correction with Weighted Finite State Transducers*, 2013.

- Seung Lee, *Modeling Director Agents' Decision-Making Strategies in Guided Discovery Learning Environments*, 2012.
- Eun Ha, *Modeling Discourse Structure and Temporal Event Relations with Markov Logic Networks*, 2011.
- Kristy Boyer (Co-advisor: Mladen Vouk), *Structural and Dialogue Act Modeling in Task-Oriented Tutorial Dialogue*, 2010.
- Scott McQuiggan, *An Inductive Framework for Affect Recognition and Expression in Interactive Learning Environments*, 2008.
- Sunyoung Lee (Co-advisor: Carla Savage), *Early Prediction of Student Goals and Affect in Narrative-Centered Learning Environments*, 2008.
- Bradford Mott (Co-advisor: Michael Young), *Decision-Theoretic Narrative Planning for Guided Exploratory Learning Environments*, 2006.
- Wei Zhang (Co-advisor: Michael Young), *Multimodal Pedagogical Planning for 3D Learning Environments*, 2004.
- Charles Callaway, *Narrative Prose Generation*, 2000.
- William Bares (Co-advisor: Woodrow Robbins), *Realtime Generation of User- and Context-Sensitive Three-Dimensional Animations*, 1998.

### **Masters Students Supervised**

- Michael Wallis (Co-advisor: Kristy Boyer), *JavaTutor – A Remotely Collaborative, Real-Time Distributed Intelligent Tutoring System for Introductory Java Computer Programming – A Qualitative Analysis*, 2011.
- Robert Phillips, *Code Understanding for an Intelligent Tutoring System*, 2011.
- Lucy Shores, *The Role of Cognitive and Metacognitive Tool Use in Narrative-Centered Learning Environments*, 2010.
- Rachel Dwight (Co-advisor: Nancy Green, UNC-Greensboro), *Microplanning and Linguistic Realization for Natural Language Generation in a Biomedical Domain*, 2009.
- Kanyamas “Jenny” Navoraphan (Co-advisor: Nancy Green, UNC-Greensboro), *Argument Generation for a Biomedical Domain*, 2008.
- Scott McQuiggan, *An Inductive Approach to Modeling Affective Reasoning in Interactive Synthetic Agents*, 2005.
- Seung Lee, *A Framework for Real-Time Synchronization in Intelligent Media Generators*, 2004.
- Randy Casstevens, *Explorations in Three-Dimensional User Interfaces for Learning Environments*, 2003.
- Gary Stelling, *Affective Behavior Control for Lifelike Pedagogical Agents*, 2002.
- Brent Daniel, *Student-Sensitive Multimodal Explanation Generation*, 1999.
- Dennis Rodriguez, *Synchronizing Speech, Locomotion, Gestures, and Virtual Cinematography in 3D Learning Environments with Lifelike Pedagogical Agents*, 1999.
- Stuart Towns, *Multimodal Explanation Generation for 3D Learning Environments*, 1999.
- Joel Grégoire, *Interactive Demonstration of Procedural Tasks in 3D Learning Environments with Lifelike Pedagogical Agents*, 1998.
- Colin Leonard, *Interface Architecture for Multi-Dimensional User Support of Information Rich Tasks*, 1997.

- Jennifer Voerman, *Deictic Behavior Control for Believable Animated Pedagogical Agents*, 1997.
- Matthew Dailey, *Intelligent Interfaces and Complex Analysis Tasks: A Knowledge-Based Interface for Biological Sequence Analysis*, 1995.

## Publications

### Journal Articles

1. K. Loderer, R. Pekrun, and J. Lester. Beyond Cold Technology: A Systematic review and Meta-analysis on Emotions in Technology-based Learning Environments. *Learning and Instruction*, in press.
2. A. Smith, S. Leeman-Munk, A. Shelton, B. Mott, E. Wiebe, and J. Lester. A Multimodal Assessment Framework for Integrating Student Writing and Drawing in Elementary Science Learning. *IEEE Transactions on Learning Technologies*, in press.
3. J. DeFalco, J. Rowe, L. Paquette, V. Georgoulas-Sherry, K. Brawner, B. Mott, R. Baker, and J. Lester. Detecting and Addressing Frustration in a Serious Game for Military Training. *International Journal of Artificial Intelligence in Education*, 28(2), 152-193, 2018.
4. M. Taub, R. Azevedo, A. Bradbury, G. Millar, and J. Lester. Using Sequence Mining to Reveal the Efficiency in Scientific Reasoning during STEM Learning with a Game-Based Learning Environment. *Learning and Instruction*, 54, 93-103, 2018.
5. M. Taub, N. Mudrick, R. Azevedo, G. Miller, J. Rowe, and J. Lester. Using Multi-Channel Data with Multi-Level Modeling to Assess In-Game Performance During Gameplay with Crystal Island. *Computers in Human Behavior*, 76, 641-655, 2017.
6. J. Rowe, E. Lobene, B. Mott, and J. Lester. Play in the Museum: Design and Development of a Game-based Learning Exhibit for Informal Science Education. *International Journal of Gaming and Computer-Mediated Simulations*, 9(3), 96-113, 2017.
7. M. Pruden, S. Kerkhoff, H. Spires, and J. Lester. Enhancing Writing Achievement Through a Digital Learning Environment: Case Studies of Three Struggling Adolescent Male Writers. *Reading & Writing Quarterly: Overcoming Learning Difficulties*, 33(1), 1-19, 2017.
8. J. Wiggins, J. Grafsgaard, K. Boyer, E. Wiebe, and J. Lester. Do You Think You Can? The Influence of Student Self-Efficacy on the Effectiveness of Tutorial Dialogue for Computer Science. *International Journal of Artificial Intelligence in Education*, 27(1), 130-153, 2017.
9. K. Tebb, R. Erenrich, C. Jasik, M. Berna, J. Lester, and E. Ozer. Use of Theory in Computer-Based Interventions to Reduce Alcohol Use Among Adolescents and Young Adults: A Systematic Review. *BMC Public Health*, 16:517, 2016.
10. A. Shelton, A. Smith, E. Wiebe, C. Behrle, R. Sirkin, and J. Lester. Drawing and Writing in Digital Science Notebooks: Sources of Formative Assessment Data. *Journal of Science Education and Technology*, 23(3), 474-488, 2016.
11. L. Johnson and James Lester. Face-to-Face Interaction with Pedagogical Agents, Twenty Years Later. *International Journal of Artificial Intelligence in Education*, 26(1), 25-36, 2016.
12. S. Lee, J. Rowe, B. Mott, and J. Lester. A Supervised Learning Framework for Modeling Director Agent Strategies in Educational Interactive Narrative. *IEEE Transactions on Computational Intelligence and AI in Games*, 6(2), 1-13, 2014.
13. J. Sabourin and J. Lester. Affect and Engagement in Game-Based Learning Environments. *IEEE Transactions on Affective Computing*, 5(1), 45-56, 2014.
14. J. Lester, H. Spires, J. Nietfeld, J. Minogue, B. Mott, and E. Lobene. Designing Game-based Learning Environments for Elementary Science Education: A Narrative-centered Learning Perspective. *Information Sciences*, 264, 4-18, 2014.



15. C. Mitchell, E. Ha, K. Boyer, and J. Lester. Learner Characteristics and Dialogue: Recognizing Effective and Student-Adaptive Tutorial Strategies. *International Journal of Learning Technology*, 8(4), 382-403, 2013.
16. J. Sabourin, L. Shores, B. Mott, and J. Lester. Understanding and Predicting Student Self-Regulated Learning Strategies in Game-Based Learning Environments. *International Journal of Artificial Intelligence in Education*, 23(1-4), 94-114, 2013.
17. J. Sabourin, J. Rowe, B. Mott and J. Lester. Considering Alternate Futures to Classify Off-Task Behavior as Emotion Self-Regulation: A Supervised Learning Approach. *Journal of Educational Data Mining*, 5(1), 9-38, 2013.
18. A. Meluso, M. Zheng, H. Spires, and J. Lester. Enhancing 5<sup>th</sup> Graders' Science Content Knowledge and Self-Efficacy Through Game-based Learning. *Computers & Education*, 59(2), 497-504, 2012.
19. H. Spires, J. Rowe, B. Mott, and J. Lester. Problem Solving and Game-Based Learning: Effects of Middle Grade Students' Hypothesis Testing Strategies on Learning Outcomes. *Journal of Educational Computing Research*, 44(4), 453-472, 2011.
20. J. Rowe, L. Shores, B. Mott, and J. Lester. Integrating Learning, Problem Solving, and Engagement in Narrative-Centered Learning Environments. *International Journal of Artificial Intelligence in Education*, 21(1-2), 115-133, 2011.
21. K. Boyer, R. Phillips, A. Ingram, E. Ha, M. Wallis, M. Vouk, and J. Lester. Investigating the Relationship Between Dialogue Structure and Tutoring Effectiveness: A Hidden Markov Modeling Approach. *International Journal of Artificial Intelligence in Education*, 21(1-2), 65-81, 2011.
22. S. McQuiggan, J. Robison, and J. Lester. Affective Transitions in Narrative-Centered Learning Environments. *Educational Technology & Society*, 13(1), 40-53, 2010.
23. S. McQuiggan and J. Lester. Modeling Affect Expression and Recognition in an Interactive Learning Environment. *International Journal of Learning Technology*, 4(3/4), 216-233, 2009.
24. K. Boyer, R. Phillips, M. Wallis, M. Vouk, and J. Lester. Investigating the Role of Motivation in Computer Science Education through One-on-One Tutoring. *Computer Science Education*, 19(2), 111-136, 2009.
25. S. McQuiggan, B. Mott, and J. Lester. Modeling Self-Efficacy in Intelligent Tutoring Systems: An Inductive Approach. *User Modeling and User-Adapted Interaction*, 18(1-2), 81-123, 2008.
26. S. McQuiggan and J. Lester. Modeling and Evaluating Empathy in Embodied Conversational Agents. *International Journal of Human-Computer Studies*, 65(4), 348-360, 2007.
27. C. Callaway and J. Lester. Narrative Prose Generation. *Artificial Intelligence*, 139(2), 213-252, 2002.
28. R. Moreno, R. Mayer, H. Spires, and J. Lester. The Case for Social Agency in Computer-Based Teaching: Do Students Learn More Deeply When They Interact with Animated Pedagogical Agents? *Cognition and Instruction*, 19(2), 177-213, 2001.
29. L. Johnson, J. Rickel, and J. Lester. Animated Pedagogical Agents: Face-to-Face Interaction in Interactive Learning Environments. *International Journal of Artificial Intelligence in Education*, 11, 47-78, 2000.  
Award: **IFAAMAS Influential Paper Award** (2017).
30. W. Bares and J. Lester. Intelligent Multi-Shot 3D Visualization Interfaces. *Knowledge-Based Systems*, 12(8), 403-412, 1999.
31. J. Lester, S. Towns, and P. FitzGerald. Achieving Affective Impact: Visual Emotive Communication in Lifelike Pedagogical Agents. *International Journal of Artificial Intelligence in Education*, 10(3-4), 278-291, 1999.
32. J. Lester, B. Stone, and G. Stelling. Lifelike Pedagogical Agents for Mixed-Initiative Problem Solving in Constructivist Learning Environments. *User Modeling and User-Adapted Interaction*, 9(1-2), 1-44, 1999.

33. J. Lester, J. Voerman, S. Towns, and C. Callaway. Deictic Believability: Coordinated Gesture, Locomotion, and Speech in Lifelike Pedagogical Agents. *Applied Artificial Intelligence*, 13(4-5), 383-414, 1999.
34. K. Branting, J. Lester, and C. Callaway. Automating Judicial Document Drafting: A Discourse-Based Approach. *Artificial Intelligence and Law*, 6(2-4), 111-149, 1998.
35. J. Lester and B. Porter. Developing and Empirically Evaluating Robust Explanation Generators: The KNIGHT Experiments. *Computational Linguistics*, 23(1), 65-101, 1997.

### Book Chapters

1. E. Ozer, A. Piatt, I. Holsen, T. Larsen, J. Lester, and E. Ozer. Innovative Approaches to Promoting Positive Youth Development in Diverse Contexts: Novel Applications of Participatory Research and New Technologies. In *Positive Youth Development in Global Contexts of Social and Economic Change*, Petersen, A., Koller, S., Motti-Stefanidi, F., & Verma, S. (eds.), pp. 201-221, Routledge / Taylor and Francis Group, New York, 2017.
2. J. Lester, B. Mott, J. Rowe, and R. Taylor. Design Principles for Pedagogical Agent Authoring Tools. In *Design Recommendations for Intelligent Tutoring Systems: Volume 3 - Authoring Tools & Expert Modeling Techniques*, Sottolare, R., Graesser, A., Hu, X., and Brawner, K. (eds.), pp. 151-160, U.S. Army Research Laboratory, Orlando, Florida, 2015.
3. J. Lester, J. Lester, E. Lobene, B. Mott, and J. Rowe. Serious Games with GIFT: Instructional Strategies, Game Design, and Natural Language in the Generalized Intelligent Framework for Tutoring. In *Design Recommendations for Adaptive Intelligent Tutoring Systems: Volume 2 – Instructional Management*, Sottolare, R., Graesser, A., Hu, X., and Goldberg, B. (eds.), pp. 205-215, U.S. Army Research Laboratory, Orlando, Florida, 2014.
4. E. Ha, J. Rowe, B. Mott, and J. Lester. Recognizing Player Goals in Open-Ended Digital Games with Markov Logic Networks. In *Plan, Activity and Intent Recognition: Theory and Practice*, Sukthankar, G., Goldman, R., Geib, C., Pynadath, D., Bui, H. H. (eds.), pp. 289-311, Morgan Kaufman, Waltham, Massachusetts, 2014.
5. J. Lester, B. Mott, J. Rowe, and J. Sabourin. Learner Modeling to Predict Real-Time Affect in Serious Games. In *Design Recommendations for Adaptive Intelligent Tutoring Systems: Volume 1 – Learner Modeling*, Sottolare, R., Graesser, A., Hu, X., and Holden, H. (eds.), pp. 201-210, U.S. Army Research Laboratory, Orlando, Florida, 2013.
6. J. Lester, J. Rowe and B. Mott. Narrative-Centered Learning Environments: A Story-Centric Approach to Educational Games. In *Emerging Technologies for the Classroom: A Learning Sciences Perspective*, Mouza, C., & Lavigne, N. (eds.), pp. 223-238, Springer, New York, 2013.
7. J. Lester, B. Mott, J. Robison, J. Rowe and L. Shores. Supporting Self-Regulated Learning in Narrative-Centered Learning Environments. In *International Handbook of Metacognition and Learning Technologies*, Azevedo, R., & Aleven, V. (eds.), pp. 471-483, Springer, New York, 2013.
8. J. Lester, S. McQuiggan, and J. Sabourin. Affect Recognition and Expression in Narrative-Centered Learning Environments. In *New Perspectives on Affect and Learning Technologies*, Calvo, R., & D’Mello, S. (eds.), pp. 85-96, 2011.
9. J. Lester, K. Branting, and B. Mott. Conversational Agents. In *Practical Handbook of Internet Computing*, Singh, M. (ed.), Chapman Hall & CRC Press, Baton Rouge, 2004.
10. J. Lester, C. Callaway, J. Grégoire, G. Stelling, S. Towns, and L. Zettlemoyer. Animated Pedagogical Agents in Knowledge-Based Learning Environments. In *Smart Machines in Education: The Coming Revolution in Educational Technology*, Forbus, K., & Feltovich, P. (eds.), pp. 269-298, AAAI/MIT Press, Menlo Park, 2001.
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45. C. Callaway, B. Daniel, J. Lester. Multilingual Natural Language Generation for 3D Learning Environments. *Proceedings of the Argentine Symposium on Artificial Intelligence*, pp. 177-190, Buenos Aires, Argentina, 1999.
46. J. Rickel, L. Johnson, and J. Lester. Why Use an Animated Pedagogical Agent? *AI-ED '99 Workshop on Instructional Uses of Animated and Personified Agents*, pp. 62-69, Le Mans, France, 1999.
47. J. Lester, S. Towns, C. Callaway, and P. FitzGerald. Deictic and Emotive Communication in Animated Pedagogical Agents. *Proceedings of the Workshop on Embodied Conversational Characters*, pp. 67-76, Lake Tahoe, California, 1998.
48. J. Lester, C. Callaway, and S. Towns. Creating Lifelike Behaviors in Animated Pedagogical Agents. *ITS-98 Workshop on Pedagogical Agents*, pp. 27-32, San Antonio, 1998.
49. J. Lester, J. Voerman, S. Towns, and C. Callaway. Cosmo: A Life-like Animated Pedagogical Agent with Deictic Believability. *IJCAI-97 Workshop on Animated Interface Agents: Making Them Intelligent*, pp. 61-69, Nagoya, Japan, 1997.
50. C. Elliott, J. Rickel, and J. Lester. Integrating Affective Computing into Animated Tutoring Agents. *IJCAI-97 Workshop on Animated Interface Agents: Making Them Intelligent*, pp. 113-121, Nagoya, Japan, 1997.
51. J. Lester, C. Callaway, B. Stone, and S. Towns. Mixed Initiative Problem Solving with Animated Pedagogical Agents. *Symposium for Computational Models for Mixed Initiative Interaction, AAAI Spring Symposium Series*, pp. 98-104, Palo Alto, California, 1997.  
Workshop Publication: Also appears in *AI-ED '97 Workshop on Pedagogical Agents*, Eighth World Conference on Artificial Intelligence in Education (AI-ED 97), Kobe, Japan.
52. K. Branting and J. Lester. Justification Structures for Document Reuse. *Working Notes of the Third European Workshop on Case-Based Reasoning*, pp. 76-90, Lausanne, Switzerland, 1996.
53. J. Lester, M. O'Leary, and B. Stone. Animated Pedagogical Agents for Intelligent Edutainment. *AAAI Workshop on Entertainment & AI/A-Life*, pp. 44-49, AAAI-96, Portland, Oregon, 1996.
54. C. Callaway and J. Lester. Robust Natural Language Generation from Large-Scale Knowledge Bases. *Proceedings of the Fourth Bar-Ilan Symposium on Foundations of Artificial Intelligence*, pp. 96-105, Jerusalem, Israel, 1995.
55. J. Lester and B. Porter. The KNIGHT Experiments: Empirically Evaluating an Explanation Generation System. *Symposium for Empirical Methods in Discourse Interpretation and Generation, AAAI Spring Symposium Series*, pp. 74-80, Palo Alto, California, 1995.



56. J. Lester and B. Porter. "Interruption Handling:" Using Dynamic Replanning and Partially Refined Plans to Deal with Users' Interruptions. *AAAI Workshop on Planning for Interagent Communication*, pp. 71-77, AAAI-94, Seattle, Washington, 1994.
57. J. Lester and B. Porter. Designing Multi-Media Knowledge Delivery Systems: The Strong Representation Paradigm. *Symposium for Intelligent Multi-Media Multi-Modal Systems*, AAAI Spring Symposium Series, pp. 64-72, Palo Alto, California, 1994.
58. J. Lester and B. Porter. An Architecture for Planning Multi-Paragraph Pedagogical Explanations. *AAAI Workshop on the Comparative Analysis of Explanation Planning Architectures*, pp. 27-41, AAAI-91, Anaheim, California, 1991.
59. J. Lester and B. Porter. Generating Integrative Explanations: A Delayed-Commitment Approach. *AAAI Workshop on Explanation*, pp. 80-89, AAAI-90, Boston, 1990.
60. Souther, J. Lester, L. Acker, and B. Porter. Accessing Information from a Large-Scale Botany Knowledge Base Designed for Multiple Tasks. *Symposium for AI and Molecular Biology*, AAAI Spring Symposium Series, pp. 141-143, Palo Alto, California, 1990.
61. J. Lester, L. Acker, A. Souther, and B. Porter. Generating Presentations of Domain Knowledge. *Symposium for Knowledge-Based Environments for Learning and Teaching*, AAAI Spring Symposium Series, pp. 41-45, Palo Alto, California, 1990.

### Invited Papers

1. L. Johnson and J. Lester. Pedagogical Agents: Back to the Future. *AI Magazine*, 39(2), 33-44, 2018.
2. H. Spires and J. Lester. Game-based Learning: Creating a Multidisciplinary Community of Inquiry. *On the Horizon*, 24(1), 88-93, 2016.
3. J. Lester, E. Ha, S. Lee, B. Mott, J. Rowe, and J. Sabourin. Serious Games Get Smart: Intelligent Game-Based Learning Environments. *AI Magazine*, 34(4), 31-45, 2013.
4. J. Rowe, B. Mott, and J. Lester. Narrative-Centered Learning Environments. In *Encyclopedia of the Sciences of Learning*, Seel, N. (ed.), pp. 2423-2426, Springer, 2011.
5. J. Lester. Reflections on the KVL Tutoring Framework: Past, Present, and Future. *International Journal of Artificial Intelligence in Education*, 16(3), pp. 271-276, 2006. (Invited Commentary)
6. J. Lester, W. Bares, C. Callaway, and S. Towns. Natural Language Generation Journeys to Interactive 3D Worlds. Invited paper for keynote address, *Proceedings of the Ninth International Workshop on Natural Language Generation*, pp. 2-7, Niagara-on-the-Lake, Ontario, Canada, 1998.
7. J. Lester. Intelligent Virtual Teachers. Invited paper for invited lecture, *Proceedings of Imagina '98*, pp. 148-152, Monaco, 1998.

### Additional Publications

1. P. Buffum, M. Frankosky, K. Boyer, E. Wiebe, B. Mott, and J. Lester. Collaboration and Gender Equity in Game-based Learning for Middle School Computer Science. *IEEE Computing in Science and Engineering*, 18(2), 18-28, 2016.
2. H. Spires, K. Turner, and J. Lester. Twenty-first Century Skills and Game-based Learning. *Proceedings of the World Conference on Educational Multimedia, Hypermedia, and Telecommunications (ED-MEDIA-08)*, pp. 5438-5443, Vienna, Austria, 2008.
3. J. Nietfeld, K. Hoffmann, S. McQuiggan, and J. Lester. Self-regulated Learning in a Narrative Centered Learning Environment. *Proceedings of the World Conference on Educational Multimedia, Hypermedia, and Telecommunications (ED-MEDIA-08)*, pp. 5322-5327, Vienna, Austria, 2008.
4. R. Moreno, R. Mayer, and J. Lester. Life-Like Pedagogical Agents in Constructivist Multimedia Environments: Cognitive Consequences of Their Interaction. *Proceedings of the World Conference*

on *Educational Multimedia, Hypermedia, and Telecommunications* (ED-MEDIA-2000), pp. 741-746, Montreal, 2000.

Award: **Outstanding Paper Award.**

5. J. Lester and P. FitzGerald. Animated Pedagogical Agents: The Next Generation of Intelligent Educational Technology. *Design in the Information Age: A Report to the National Science Foundation*, pp. 111-117, 1997.
6. M. Vouk, A. Rindos, S. Woolet, J. Hines, and J. Lester. ATM Technology Enabling Educational Applications Across the North Carolina Information Highway. *Telecom '95*, pp. 519-522, Geneva, Switzerland, 1995.
7. B. Porter, L. Acker, J. Lester, and A. Souther. Generating Explanations in an Intelligent Tutor Designed to Teach Fundamental Knowledge. *Proceedings of the Second Intelligent Tutoring Systems Research Forum*, pp. 55-69, San Antonio, Texas, 1989.

### Technical Reports

1. J. Lester. Generating Natural Language Explanations from Large-Scale Knowledge Bases. Computer Science Technical Report TR-94-11, North Carolina State University, 1994.
2. J. Lester and B. Porter. Generating Context-Sensitive Explanations in Interactive Knowledge-Based Systems. AI Laboratory Technical Report AI91-160, University of Texas at Austin, May 1991.
3. B. Porter, J. Lester, K. Murray, K. Pittman, A. Souther, L. Acker, and T. Jones. AI Research in the Context of a Multifunctional Knowledge Base: The Botany Knowledge Base Project. AI Laboratory Technical Report AI88-88, University of Texas at Austin, September 1988.

### Dissertation

1. J. Lester. *Generating Natural Language Explanations from Large-Scale Knowledge Bases*, University of Texas at Austin, Austin, Texas, 1994.

### Patents

1. S. Leeman-Munk, W. Min, B. Mott, J. Lester, and J. Cox. *Normalizing Electronic Communications Using a Neural-Network Normalizer and a Neural-Network Flagger*. U.S. Patent 9,552,547. Filed: November 2015. Issued: January 2017.
2. J. Lester, L. Zettlemoyer, B. Mott, and W. Bares. *Methods, Systems, and Computer Program Products for Providing Automated Customer Service via an Intelligent Virtual Agent that is Trained Using Customer-agent Conversations*. U.S. Patent 7,305,345. Filed: February 2001. Issued: December 2007.

### Lectures

#### Conference and Workshop Invited Speaker Presentations

1. Invited Lecture, Serious Play  
*Narrative-Centered Learning Environments*  
George Mason University, Manassas, Virginia, July 2017.
2. Keynote Address, Third International Workshop on Intelligent Digital Games for Empowerment and Inclusion  
*Narrative-Centered Learning Environments*  
Held in conjunction with the Twentieth ACM Conference on Intelligent User Interfaces (IUI-2015)  
Atlanta, March 2015.
3. Invited Lecture, ICT Workshop on Empirical Research with Pedagogical Agents  
*From Coaches to Creative Collaborators: Empathic Pedagogical Agents*

University of Southern California, Institute for Creative Technologies, Playa Vista, California, October 2014.

4. Keynote Address, Third Workshop on Games and NLP (GAMNLP-2014)  
*Narrative-Centered Learning Environments*  
Raleigh, North Carolina, October 2014.
5. Keynote Address, Seventh International Conference on Natural Language Generation (INLG-2012)  
*Expressive NLG for Next-Generation Learning Environments: Language, Affect, and Narrative*  
Utica, Illinois, June 2012.
6. Keynote Address, Fourth International Conference on Affective Computing and Intelligent Interaction (ACII-2011)  
*Affect, Learning, and Delight*  
Memphis, Tennessee, October 2011.
7. Featured Speaker, Twelfth International Conference on College Teaching and Learning  
Panel: *Best Practices in Online Learning*  
Jacksonville, Florida, April 2001.
8. Keynote Address, Lifelike Computer Characters '98  
*Out of the Lab and into the World: Lifelike Computer Characters Go to School*  
Snowbird, Utah, October 1998.
9. Keynote Address, Ninth International Workshop on Natural Language Generation  
*Natural Language Generation Journeys to Interactive 3D Worlds*  
Niagara-on-the-Lake, Ontario, Canada, August 1998.
10. Invited Lecture, Fifteenth Twente Workshop on Language Technology: Interactions in Virtual Worlds  
*Natural Language Generation in Multimodal Learning Environments: Lifelike Agents and 3D Animated Explanation Generation*  
University of Twente, Enschede, The Netherlands, May 1999.
11. Invited Lecture, Imagina: The European Image Technology Event  
Organized by Institut National de l'Audiovisuel and the Monte-Carlo Television Festival  
*Intelligent Virtual Teachers*  
Monaco, March 1998.

## Colloquia

1. RTI International  
*Towards Intelligent Narrative-Centered Learning Environments*  
Research Triangle Park, North Carolina, April 2018.
2. College of Charleston  
*Intelligent Game-based Learning Environments*  
Charleston, South Carolina, April 2016.
3. University of Florida  
*Narrative-Centered Learning Environments*  
Gainesville, Florida, October 2015.
4. Australian Council for Educational Research (ACER)  
*Narrative-Centered Learning Environments*  
Melbourne, Australia, April 2015.
5. University of Melbourne  
*Narrative-Centered Learning Environments*  
Melbourne, Australia, April 2015.
6. DePaul University  
*Narrative-Centered Learning Environments*  
Chicago, May 2014.

7. Columbia University  
*Recognizing Students' Goals in Game-Based Learning Environments: A Markov Logic Approach*  
Co-Presenter: J. Rowe  
New York, September 2013.
8. Texas A&M University  
*Narrative-Centered Learning Environments*  
College Station, November 2012.
9. IT University of Copenhagen  
*Narrative-Centered Learning Environments*  
Copenhagen, Denmark, August 2012.
10. The Concord Consortium  
*Narrative-Centered Learning Environments*  
Concord, MA, July 2012.
11. Arizona State University  
*Narrative-Centered Learning Environments*  
Tempe, Arizona, January 2012.
12. University of North Carolina at Charlotte  
*Multimodal Intelligent Tutoring Systems*  
Charlotte, January 2011.
13. University of North Carolina at Charlotte  
*Narrative-Centered Learning Environments*  
Charlotte, November 2010.
14. Carnegie Mellon University  
*Narrative-Centered Learning Environments*  
Pittsburgh, April 2010.
15. Carnegie Mellon University  
*Interdisciplinary Research in 7 (or a Few More) Easy Steps*  
Pittsburgh, April 2010.
16. University of Texas at Austin  
*Narrative-Centered Learning Environments*  
Austin, Texas, March 2010.
17. University of Rochester  
*Characters, Explanation & Story: Intelligent Media Systems and Narrative Generation for Knowledge-Based Learning Environments*  
Rochester, NY, November 2002.
18. University of Toronto  
Computer Science Distinguished Colloquium Series  
*Intelligent Multimedia Systems for Knowledge-Based Learning Environments*  
Toronto, November 2000.
19. MITRE  
*Lifelike Pedagogical Agents and 3D Animated Explanation Generation for Learning Environments*  
Washington, DC, September 2000.
20. Northwestern University  
*Animated Pedagogical Agents and 3D Animated Explanation Generators for Next-Generation Knowledge-Based Learning Environments*  
Evanston, IL, May 1998.
21. University of Delaware  
*Animated Pedagogical Agents and 3D Animated Explanation Generators for Next-Generation Knowledge-Based Learning Environments*  
Newark, Delaware, May 1998.

22. MIT, The Media Laboratory  
*Learning Environments for the 21<sup>st</sup> Century: Lifelike Pedagogical Agents, Learner-Centered Virtual Cinematography, and 3D Animated Explanation Generation*  
Cambridge, MA, April 1998.
23. German Center for Artificial Intelligence Research (DFKI)  
*Realtime Generation of User- and Task-Sensitive 3D Cinematography & Animated Explanations*  
Saarbrücken, Germany, March 1998.
24. Information Sciences Institute, University of Southern California  
*Generating Natural Language Explanations from Large-Scale Knowledge Bases*  
Marina del Rey, California, May 1996.
25. Southern Methodist University  
*Generating Natural Language Explanations from Large-Scale Knowledge Bases*  
Dallas, January 1994.
26. Microelectronics and Computer Technology Corporation (MCC)  
Knowledge-Based Natural Language Processing Group  
*Context-Sensitive Multi-Paragraph Discourse Planning with Large-Scale Knowledge Bases*  
Austin, March 1992.
27. University of Wyoming  
*KNIGHT: A Student-Sensitive Discourse Generator for Intelligent Tutoring Systems*  
Laramie, Wyoming, September 1991.

### **Other National and International Presentations**

1. Science of Learning Symposium  
J. Lester (Panelist).  
*Panel on Intelligent Learning Environments*  
Brisbane, Australia, 2015.
2. NARST Symposium on Big Data and Learning Analytics  
J. Lester, E. Wiebe, and A. Smith.  
*Towards Sketch-based Learning Analytics*  
National Association for Research in Science Teaching, Chicago, 2015.
3. NSF DRK-12 PI Meeting Session on Navigating to NGSS Success: Identifying a Research Agenda  
J. Lester.  
*The Leonardo Project: Scalable Modeling and Adaptive Guidance in an Intelligent Cyberlearning Environment for Upper-Elementary Science Education*  
DRK-12 PI Meeting, Washington, 2014.
4. AERA Symposium on Using Educational Data Mining for Science Inquiry Skill Assessment and Prediction  
S. Leeman-Munk, E. Wiebe, and J. Lester.  
*Mining Student Science Argumentation Text to Inform an Intelligent Tutoring System*  
American Educational Research Association, San Francisco, 2013.
5. AERA  
J. Nietfeld, J. Minogue, H. Spires, and J. Lester.  
*Girls and Games: Examining the Performance and Self-Regulation of Girls in a Science Gaming Environment*  
American Educational Research Association, San Francisco, 2013.
6. NCSA Session on So Deeply Embedded, ‘Assessment’ Disappears: A Report from Two Next Generation Learning Challenge Winners  
N. Heffernan, J. Rowe, B. Delaney, C. Heffernan, and J. Lester.  
*The Crystal Island: Lost Investigation Project*  
National Conference on Student Assessment, Minneapolis, 2012.
7. AERA Symposium on Advances in Assessing Game-Based Learning

- J. Lester, J. Minogue, J. Nietfeld, and H. Spires.  
*Tracing the Design and Testing of a Game-Based Learning Environment for Upper Elementary Students*  
American Educational Research Association, Vancouver, 2012.
8. AERA Symposium on Measuring Self-Regulated Learning With Multi-Agent Learning Environments  
J. Sabourin and J. Lester.  
*Self-Regulated Learning in Exploratory Game-Based Learning Environment*  
American Educational Research Association, Vancouver, 2012.
  9. AERA Symposium on Knowing What Students Know and Feel: Innovative Technology-Rich Assessments  
J. Rowe, J. Sabourin, and J. Lester.  
*Affect and Off-Task Behavior in Narrative-Centered Learning Environments*  
American Educational Research Association, Vancouver, 2012.
  10. Cyberlearning Research Summit  
*Learning and Engagement in Narrative-Centered Learning Environments*  
National Geographic Society, Washington, D.C., 2012.  
CADRE Gaming SIG  
*Developing Science Problem-solving Skills and Engagement through Intelligent Game-based Learning Environments*  
Education Development Center, Washington, D.C., 2011.
  11. AERA Symposium on Middle-Grades Student Achievement, Engagement, and Experience  
H. Spires, L. Hervey, J. Rowe, B. Mott, and J. Lester.  
*Do Think-Aloud Protocols (TAPs) Lead to Higher Levels of Writing Self-efficacy and Achievement When Sixth Graders Use a Narrative-Centered Learning Environment?*  
American Educational Research Association, Denver, 2010.
  12. AERA Symposium on Affect-Sensitive Learning Technologies  
J. Lester, J. Robison, and J. Rowe.  
*Modeling and Supporting Student Affect in Game-Based Learning Environments*  
American Educational Research Association, Denver, 2010.
  13. AERA Symposium on Recent Advances in the Design of Games That Support Learning  
H. Spires, L. Hervey, J. Rowe, B. Mott, and J. Lester.  
*Effects of Game-Based Performance on Science Learning: A Transactional Theoretical Perspective*  
American Educational Research Association, Denver, 2010.
  14. AERA Symposium on Understanding the Complex Nature of Self-Regulatory Processes During Learning with Computer-Based Learning Environments  
J. Lester, S. McQuiggan, J. Nietfeld, K. Hoffmann, J. Robison, H. Spires.  
*Modeling Metacognitive Monitoring in Narrative-Centered Learning Environments*  
American Educational Research Association, San Diego, 2009.
  15. AERA Symposium on Student Engagement in Middle Grades  
H. Spires, L. Hervey, T. Watson, and J. Lester.  
*Middle Grades Students and Game-Based Learning: Creativity, Engagement, and Writing Achievement*  
American Educational Research Association, San Diego, 2009.
  16. AERA Symposium on Motivation, Affect, and Engagement in Game-Based Learning Environments  
J. Lester and S. McQuiggan.  
*Affect and Motivation in Narrative-Centered Learning Environments*  
American Educational Research Association, New York, 2008.
  17. AERA Symposium on Intelligent Tutoring Systems: What Do We Do Next?  
S. McQuiggan and J. Lester.  
*Motivating Students in the Frustration Window*  
American Educational Research Association, New York, 2008.

18. AERA Symposium on Animated Pedagogical Agents  
J. Lester and P. FitzGerald.  
*Designing Animated Pedagogical Agents: Foundational Technologies and Theoretical Constructs*  
American Educational Research Association, New Orleans, 2000.
19. Plenary Session Address, AAAI 2000 Spring Symposium Smart Graphics  
Stanford University, March 2000.
20. U.S. Department of Labor Joint Employment & Training Technology Conference  
J. Lester and P. FitzGerald.  
*Animated Pedagogical Agents*  
Washington, DC, 1996.
21. NIST Workshop on Education and Training Technology  
J. Lester and P. FitzGerald.  
*Animated Pedagogical Agents: The Next Generation of Intelligent Educational Technology*  
National Institute of Standards and Technology  
Washington, DC, 1996.

## Professional Service

### Editorial Leadership

- Guest Editor, *International Journal of Artificial Intelligence in Education*, 28(2), Special Issue on the Generalized Intelligent Framework for Tutoring (GIFT), with R. Sottolare, R. Baker, and A. Graesser, 2018.
- Editor-in-Chief, *International Journal of Artificial Intelligence in Education*, 2009-2012.
- Associate Editor, *International Journal of Artificial Intelligence in Education*, 2016-present.
- Associate Editor, *IEEE Transactions on Affective Computing*, 2014-present.
- Guest Editor, *International Journal of Artificial Intelligence in Education*, 2006.
- Guest Editor, *AI Magazine*, Special Issue on Intelligent User Interfaces, Winter 2001.

### Editorial Boards

- *International Journal of STEM Education*, 2014-present.
- *International Journal of Artificial Intelligence in Education*, 2013-2016.
- *Metacognition and Learning*, 2012-present.
- *LNCS Transactions on Edutainment*, 2008-present.
- *Autonomous Agents and Multi-Agent Systems*, 1999-2007.

### Steering and Executive Committees

- Steering Committee, *IEEE Transactions on Transactions on Learning Technologies*, 2015-2018.
- Steering Committee, *IEEE Transactions on Transactions on Affective Computing*, 2009-2012.
- Executive Committee, HUMAINE Association for Affective Computing, 2007-2009.
- Steering Committee, International Conference on Intelligent Tutoring Systems, 2004-present.

### **Conference and Program Committees Chaired**

- Program Chair, International Conference on Foundations of Digital Games (FDG-2013), 2013.
- Program Co-Chair, International Conference on Interactive Digital Storytelling (ICIDS-2011), 2011.
- Conference Co-Chair, International Conference on Intelligent Virtual Agents (IVA-2008), 2008.
- Program Chair, International Conference on Intelligent Tutoring Systems (ITS-2004), 2004.
- Program Chair, International Conference on Intelligent User Interfaces (IUI-2001), 2001.

### **Conference Special Tracks Chaired**

- Co-Chair, Cognitive Systems Track, Thirtieth AAAI Conference on Artificial Intelligence (AAAI-2016), 2016.
- Chair, Virtual Agents Track, Tenth International Conference on Autonomous Agents and Multiagent Systems (AAMAS-2011), 2011.

### **Proceedings Edited**

- Editor (with M. Si, D. Thue, E. André, J. Tanenbaum, and V. Zammitto), *Interactive Storytelling: 4<sup>th</sup> International Conference on Interactive Digital Storytelling, ICIDS 2011*, Springer, LNCS 7069, 2011.
- Editor (with H. Prendinger and M. Ishizuka), *Intelligent Virtual Agents: Eight International Conference, IVA 2008*, Springer-Verlag, LNCS 5208, 2008.
- Editor (with R. Vicari and F. Paraguaçu), *Intelligent Tutoring Systems*, Springer-Verlag, LNCS 3220, 2004.

### **Elected Office**

- ACM Special Interest Group on Artificial Intelligence (SIGART) Secretary-Treasurer, 1997-1999.

### **Conference Organizing Committees**

- Awards Co-Chair, Nineteenth International Conference on Artificial Intelligence in Education (AIED-2018), London, 2018.
- Treasurer, First International Conference on Autonomous Agents (Agents-1997), Marina del Rey, California, 1997.

### **Symposia and Workshops Chaired**

- Co-Chair, AIED-09 Workshop on Question Generation.  
Venue: Brighton, UK, 2009.
- Co-Chair, AIED-97 Workshop on Pedagogical Agents.  
Venue: Kobe, Japan, 1997.

### **Conference Program Committee Member**

- Senior Program Committee: Twelfth International Conference on Educational Data Mining (EDM-2019), Montreal, 2019.
- Program Committee: Twenty-Seventh Conference on User Modeling, Adaptation, and Personalization (UMAP-2019), Larnaca, Cyprus, 2019.



- Program Committee: Fifteenth International Conference on Intelligent Tutoring Systems (ITS-2018), Jamaica, 2019.
- Program Committee: 2019 International Conference on Autonomous Agents and Multiagent Systems (AAMAS-2019), Montreal, 2019.
- Program Committee: Ninth International Conference on Learning Analytics & Knowledge (LAK-2019), Tempe, Arizona, 2019.
- Program Committee: Second IEEE International Conference on Artificial Intelligence and Virtual Reality (AVIR-2018), Osaka, 2018.
- Program Committee: Eleventh International Conference on Interactive Digital Storytelling (ICIDS-2018), Dublin, 2018.
- Program Committee: Fourteenth AAAI Conference on Artificial Intelligence and Interactive Digital Entertainment (AIIDE-2018), Edmonton, 2018.
- Senior Program Committee: Eighteenth International Conference on Intelligent Virtual Agents (IVA-2018), Sydney, 2018.
- Program Committee: Twenty-Seventh International Conference on Computational Linguistics (COLING-2018), Santa Fe, 2018.
- Program Committee: IEEE Conference on Computational Intelligence and Games (CIG-2018), Maastricht, 2018.
- Senior Program Committee: Eleventh International Conference on Educational Data Mining (EDM-2018), Buffalo, New York, 2018.
- Senior Program Committee: Twenty-Seventh International Joint Conference on Artificial Intelligence (IJCAI-2018), Stockholm, 2018.
- Program Committee: Nineteenth Annual Meeting of the Special Interest Group on Discourse and Dialogue (SIGDIAL-2018), Melbourne, 2018.
- Program Committee: 2018 International Conference on Autonomous Agents and Multiagent Systems (AAMAS-2018), Stockholm, 2018.
- Program Committee: Twenty-Sixth Conference on User Modeling, Adaptation, and Personalization (UMAP-2018), Singapore, 2018.
- Program Committee: Nineteenth International Conference on Artificial Intelligence in Education (AIED-2018), London, 2018.
- Senior Program Committee: Fourteenth International Conference on Intelligent Tutoring Systems (ITS-2018), Montreal, 2018.
- Program Committee: Sixteenth Annual Conference of the North American Chapter of the Association for Computational Linguistics: Human Language Technologies (NAACL-HLT-2018), New Orleans, 2018.
- Program Committee: Technology, Mind & Society, Washington, 2018.
- Program Committee: Thirteenth IEEE Conference on Automatic Face and Gesture Recognition (FG-2018), Xi'an, China, 2018.
- Program Committee: Eighth International Conference on Learning Analytics and Knowledge (LAK-2018), Sydney, 2018.
- Program Committee: Thirty-Second AAAI Conference on Artificial Intelligence (AAAI-2018), New Orleans, 2018.
- Program Committee: Tenth International Conference on Interactive Digital Storytelling (ICIDS-2017), Funchal, Madeira, Portugal, 2017.

- Program Committee: Thirteenth Annual Conference on Artificial Intelligence and Interactive Digital Entertainment (AIIDE-2017), Snowbird, Utah, 2017.
- Program Committee: International Conference on Affective Computing and Intelligent Interaction (ACII-2017), San Antonio, 2017.
- Senior Program Committee: Seventeenth International Conference on Intelligent Virtual Agents (IVA-2017), Stockholm, 2017.
- Senior Program Committee: Twenty-Sixth International Joint Conference on Artificial Intelligence (IJCAI-2017), Melbourne, 2017.
- Program Committee: Eighteenth Annual Meeting of the Special Interest Group on Discourse and Dialogue (SIGDIAL-2017), Saarbrücken, Germany, 2017.
- Program Committee: Twenty-Fifth Conference on User Modeling, Adaptation, and Personalization (UMAP-2017), Bratislava, Slovakia, 2017.
- Senior Program Committee: Eighteenth International Conference on Artificial Intelligence in Education (AIED-2017), Wuhan, China, 2017.
- Senior Program Committee: Tenth International Conference on Educational Data Mining (EDM-2017), Wuhan, China, 2017.
- Program Committee: Twelfth IEEE Conference on Automatic Face and Gesture Recognition (FG-2017), Washington, 2017.
- Program Committee: Fifth Annual Conference on Advances in Cognitive Systems (ACS-2017), Troy, New York, 2017.
- Program Committee: Seventh International Conference on Learning Analytics and Knowledge (LAK-2017), Vancouver, 2017.
- Program Committee: Ninth International Conference on Interactive Digital Storytelling (ICIDS-2016), Los Angeles, 2016.
- Program Committee: Twelfth Annual Conference on Artificial Intelligence and Interactive Digital Entertainment (AIIDE-2016), San Francisco, 2016.
- Program Committee: Seventeenth Annual Meeting of the Special Interest Group on Discourse and Dialogue (SIGDIAL-2016), Los Angeles, 2016.
- Program Committee: Fourth Annual Conference on Advances in Cognitive Systems (ACS-2016), Chicago, 2015.
- Senior Program Committee: Sixteenth International Conference on Intelligent Virtual Agents (IVA-2016), Los Angeles, 2016.
- Program Committee: Twenty-Fourth Conference on User Modeling, Adaptation, and Personalization (UMAP-2016), Halifax, 2016.
- Program Committee: Twenty-Fifth International Joint Conference on Artificial Intelligence (IJCAI-2016), New York, 2016.
- Program Committee: Ninth International Conference on Educational Data Mining (EDM-2016), Raleigh, North Carolina, 2016.
- Senior Program Committee: Thirteenth International Conference on Intelligent Tutoring Systems (ITS-2016), Zagreb, Croatia, 2016.
- Senior Program Committee: 2016 International Conference on Autonomous Agents and Multiagent Systems (AAMAS-2016), Singapore, 2016.
- Program Committee: Eleventh Annual Conference on Artificial Intelligence and Interactive Digital Entertainment (AIIDE-2015), Santa Cruz, California, 2015.

- Program Committee: Eighth International Conference on Knowledge Capture (K-CAP-2015), Palisades, New York, 2015.
- Program Committee: Sixteenth Annual Meeting of the Special Interest Group on Discourse and Dialogue (SIGDIAL-2015), Prague, 2015.
- Program Committee: Third Annual Conference on Advances in Cognitive Systems (ACS-2015), Atlanta, 2015.
- Senior Program Committee: Fifteenth International Conference on Intelligent Virtual Agents (IVA-2015), Delft, The Netherlands, 2015.
- Program Committee: Tenth International Conference on the Foundations of Digital Games (FDG-2015), Pacific Grove, California, 2015.
- Program Committee: Fifth-Third Annual Meeting of the Association for Computational Linguistics (ACL-2015) and the Seventh International Joint Conference on Natural Language Processing, Beijing, 2015.
- Program Committee: Twenty-Third Conference on User Modeling, Adaptation, and Personalization (UMAP-2015), Dublin, 2015.
- Senior Program Committee: Seventeenth International Conference on Artificial Intelligence in Education (AIED-2015), Madrid, 2015.
- Program Committee: Third Annual Conference on Advances in Cognitive Systems (ACS-2015), Atlanta, 2015.
- Program Committee: Twenty-Ninth AAAI Conference on Artificial Intelligence (AAAI-2015), Austin, 2015.
- Program Committee: Tenth Annual Conference on Artificial Intelligence and Interactive Digital Entertainment (AIIDE-2014), Raleigh, North Carolina, 2014.
- Senior Program Committee: Fourteenth International Conference on Intelligent Virtual Agents (IVA-2014), Boston, 2014.
- Program Committee: Twenty-Eighth AAAI Conference on Artificial Intelligence (AAAI-2014), Québec City, Québec, Canada, 2014.
- Program Committee: Twenty-Second Conference on User Modeling, Adaptation and Personalization (UMAP-2014), Aalborg, Denmark, 2014.
- Program Committee: Fifteenth Annual Meeting of the Special Interest Group on Discourse and Dialogue (SIGDIAL-2014), Philadelphia, 2014.
- Senior Program Committee: Twelfth International Conference on Intelligent Tutoring Systems (ITS-2014), Honolulu, Hawaii, 2014.
- Program Committee: Ninth International Conference on the Foundations of Digital Games (FDG-2014), Fort Lauderdale, Florida, 2014.
- Program Committee: Ninth Annual Conference on Artificial Intelligence and Interactive Digital Entertainment (AIIDE-2013), Boston, 2013.
- Program Committee: Fifth International Conference on Affective Computing and Intelligent Interaction (ACII-2013), Geneva, Switzerland, 2013.
- Senior Program Committee: Sixteenth International Conference on Artificial Intelligence in Education (AIED-2013), Memphis, 2013.
- Program Committee: Seventh International Conference on Knowledge Capture (K-CAP-2013), Banff, 2013.

- Program Committee: Twenty-First Conference on User Modeling, Adaptation and Personalization (UMAP-2013), Rome, 2013.
- Senior Program Committee: Twelfth International Conference on Autonomous Agents and Multiagent Systems (AAMAS-2013), St. Paul, Minnesota, 2013.
- Program Committee: Eighth Annual Conference on Artificial Intelligence and Interactive Digital Entertainment (AIIDE-2012), Stanford, 2012.
- Senior Program Committee: Twelfth International Conference on Intelligent Virtual Agents (IVA-2012), Santa Cruz, 2012.
- Program Committee: Thirteenth Annual Meeting of the Special Interest Group on Discourse and Dialogue (SIGDIAL-2012), Seoul, 2012.
- Program Committee: Fiftieth Annual Meeting of the Association for Computational Linguistics (ACL-2012), Jeju, South Korea, 2012.
- Program Committee: Twentieth Conference on User Modeling, Adaptation and Personalization (UMAP-2012), Montreal, 2012.
- Senior Program Committee: Eleventh International Conference on Intelligent Tutoring Systems (ITS 2012), Crete, 2012.
- Program Committee: 2012 Conference of the North American Chapter of the Association for Computational Linguistics: Human Language Technologies (NAACL-HLT 2012), Montreal, 2012.
- Senior Program Committee: Eleventh International Conference on Autonomous Agents and Multiagent Systems (AAMAS-2012), Valencia, 2012.
- Program Committee: Fourth IEEE International Conference on Digital Game and Intelligent Toy Enhanced Learning (DIGITEL-2012), Kagawa, Japan, 2012.
- Associate Chair: 2012 ACM International Conference on Intelligent User Interfaces (IUI-2012), Lisbon, 2012.
- Program Committee: Seventh Annual Conference on Artificial Intelligence and Interactive Digital Entertainment (AIIDE-2011), Stanford, 2011.
- Program Committee: Eleventh International Conference on Intelligent Virtual Agents (IVA-2011), Reykjavik, Iceland, 2011.
- Program Committee: International Conference on Affective Computing and Intelligent Interaction (ACII-2011), Memphis, 2011.
- Program Committee: Twenty-Fifth AAAI Conference on Artificial Intelligence (AAAI-2011), San Francisco, 2011.
- Senior Program Committee: Fifteenth International Conference on Artificial Intelligence in Education (AIED-2011), Auckland, New Zealand, 2011.
- Program Committee: Forty-Ninth Annual Meeting of the Association for Computational Linguistics: Human Language Technologies (ACL-HLT-2011), Portland, Oregon, 2011.
- Program Committee: Nineteenth Conference on User Modeling, Adaptation and Personalization (UMAP-2011), Girona, Spain, 2011.
- Program Committee: Sixth International Conference on Knowledge Capture (K-CAP-2011), Banff, 2011.
- Program Committee: International Conference on Intelligent User Interfaces (IUI-2011), Palo Alto, 2011.
- Program Committee: Conference on Empirical Methods in Natural Language Processing (EMNLP-2010), Boston, 2010.

- Senior Program Committee: Tenth International Conference on Intelligent Tutoring Systems (ITS-2010), Pittsburgh, 2010.
- Senior Program Committee: Ninth International Conference on Autonomous Agents and Multiagent Systems (AAMAS-2010), Special Track on Virtual Agents, Toronto, 2010.
- Program Committee: Twenty-Fourth AAAI Conference on Artificial Intelligence (AAAI-2010), Atlanta, 2010.
- Program Committee: 2010 International Conference on Intelligent User Interfaces (IUI-2010), Hong Kong, 2010.
- Program Committee: Tenth Annual Meeting of the Special Interest Group on Discourse and Dialogue (SIGDIAL-2010), Tokyo, 2010.
- Program Committee: Tenth International Conference on Intelligent Virtual Agents (IVA-2010), Philadelphia, 2010.
- Program Committee: Eighteenth Conference on User Modeling, Adaptation and Personalization (UMAP-2010), Hawaii, 2010.
- Program Committee: Sixth International Conference on Natural Language Generation (INLG-10), Trim, Ireland, 2010.
- Program Committee: Fifth International Conference on Knowledge Capture (K-CAP-2009), Redondo Beach, California, 2009.
- Program Committee: Twenty-First International Joint Conference on Artificial Intelligence (IJCAI-2009), Pasadena, California, 2009.
- Program Committee: Eighth International Conference on Autonomous Agents and Multiagent Systems (AAMAS-2009), Budapest, Hungary, 2009.
- Program Committee: Ninth International Conference on Intelligent Virtual Agents (IVA-2009), Amsterdam, 2009.
- Program Committee: First IEEE International Conference on Games and Virtual Worlds for Serious Applications (VS-GAMES-2009), Coventry, UK, 2009
- Program Committee: Seventeenth International Conference on Computers in Education, ICCE Conference on AIED/ITS & Adaptive Learning (ICCE AIED/ITS-2009), Hong Kong, 2009.
- Program Committee: 2009 International Conference on Intelligent User Interfaces (IUI-2009), Sanibel Island, Florida, 2009.
- Program Committee: Ninth Annual Meeting of the Special Interest Group on Discourse and Dialogue (SIGDIAL-2009), London, 2009.
- Senior Program Committee: Ninth International Conference on Intelligent Tutoring Systems (ITS-2008), Montreal, 2008.
- Program Committee: Seventh International Conference on Autonomous Agents and Multiagent Systems (AAMAS-2008), Virtual Agents Special Track, Estoril, Portugal, 2008.
- Senior Program Committee: Sixteenth International Conference on Computers in Education, ICCE Conference on AIED/ITS & Adaptive Learning (ICCE AIED/ITS-2008), Tapei, Taiwan, 2008.
- Program Committee: Second IEEE International Conference on Digital Games and Intelligent Toys Based Education (DIGITEL-2008), Banff, Alberta, 2008.
- Program Committee: Fifth International Conference on Natural Language Generation (INLG-08), Salt Fork State Park, Ohio, 2008.
- Senior Program Committee: Twenty-Second AAAI Conference on Artificial Intelligence (AAAI-2007), Vancouver, 2007.

- Program Committee: Sixth International Conference on Autonomous Agents and Multiagent Systems (AAMAS-2007), Honolulu, 2007.
- Program Committee: Seventh International Conference on Intelligent Virtual Agents (IVA-2007), Paris, 2007.
- Program Committee: Thirteenth International Conference on Artificial Intelligence in Education (AIED-2007), Marina del Rey, CA, 2007.
- Program Committee: 2007 International Conference on Intelligent User Interfaces (AIED-2007), Honolulu, 2007.
- Senior Program Committee: Twenty-First National Conference on Artificial Intelligence (AAAI-2006) Boston, 2006.
- Program Committee & Meta-Reviewer: 2006 International Conference on Intelligent User Interfaces (IUI-2006), Sydney, 2006.
- Program Committee: Sixth International Conference on Intelligent Virtual Agents (IVA-2006), Marina del Rey, CA, 2006.
- Program Committee: Fifth International Conference on Entertainment Computing (ICEC-2006), Cambridge, England, 2006.
- Program Committee: Second International Conference on Narrative and Interactive Learning Environments (NILE-2006), Edinburgh, 2006.
- Program Committee: Fifth Joint Conference on Autonomous Agents & Multiagent Systems (AAMAS-2006), Hakodate, Japan, 2006.
- Program Committee: 2005 International Conference on Intelligent User Interfaces (IUI-2005), San Diego, 2005.
- Program Committee: Fifth International Working Conference on Intelligent Virtual Agents (IVA-2005), Kos, Greece, 2005.
- Program Committee: Eighteenth International Conference on Computer Animation and Social Agents (CASA-2005), Hong Kong, 2005.
- Program Committee: Twelfth International Conference on Artificial Intelligence in Education (AIED-2005), Amsterdam, 2005.
- Senior Program Committee: Nineteenth National Conference on Artificial Intelligence (AAAI-2004), San Jose, 2004.
- Program Committee: 2004 International Conference on Intelligent User Interfaces (IUI-2004), Madeira, Portugal, 2004.
- Program Committee: Seventeenth International Conference on Computer Animation and Social Agents (CASA-2004), Geneva, Switzerland, 2004.
- Program Committee: Third International Conference on Entertainment Computing (ICEC-2004), Eindhoven, The Netherlands, 2004.
- Program Committee: Fourth International Conference on Computational Semiotics for Games and New Media (COSIGN-2004), Split, Croatia, 2004.
- Program Committee: Second International Joint Conference on Autonomous Agents & Multiagent Systems (AAMAS-2003), Melbourne, Australia, 2003.
- Program Committee: 2003 International Conference on Intelligent User Interfaces (IUI-2003), Miami, 2003.
- Program Committee: Third International Conference on Computational Semiotics for Games and New Media (COSIGN-2003), Middlesbrough, UK, 2003.

- Program Committee: International Conference of Computers in Education (ICCE-2003), Hong Kong, 2003.
- Program Committee: 2002 International Conference on Intelligent User Interfaces (IUI-2002), San Francisco, 2002.
- Program Committee: First International Joint Conference on Autonomous Agents & Multiagent Systems (AAMAS-2002), Bologna, Italy, 2002.
- Program Committee: Sixth International Conference on Intelligent Tutoring Systems (ITS-2002), Biarritz, France, 2002.
- Program Committee: Second International Conference on Computational Semiotics for Games and New Media (COSIGN-2002), Augsburg, Germany, 2002.
- Senior Program Committee: Fifth International Conference on Autonomous Agents (Agents-2001), Montreal, 2001.
- Program Committee: Joint International Conference on Computers in Education and International Conference on Computer-Assisted Instruction (ICCE/ICCAI-2000), Taipei, Taiwan, 2000.
- Senior Program Committee: Seventeenth National Conference on Artificial Intelligence (AAAI-2000), Austin, 2000.
- Program Committee: Fourth International Conference on Autonomous Agents (Agents-2000), Barcelona, Spain, 2000.
- Program Committee: International Conference on Natural Language Generation (INLG-2000), Mitzpe Ramon, Israel, 2000.
- Program Committee: Fifth International Conference on Intelligent Tutoring Systems (ITS-2000), Montreal, 2000.
- Program Committee: Third International Conference on Autonomous Agents (Agents-1999), Seattle, 1999.
- Program Committee: International Conference on Intelligent User Interfaces (IUI-99), Los Angeles, 1999.
- Program Committee & Organizing Committee: International Conference on Intelligent User Interfaces (IUI-98), San Francisco, 1998.
- Program Committee: Fifteenth National Conference on Artificial Intelligence (AAAI-98), Madison, Wisconsin, 1998.
- Program Committee: Autonomous Second International Conference on Autonomous Agents (Agents-1998), Minneapolis, 1998.
- Program Committee: Fourteenth National Conference on Artificial Intelligence (AAAI-1997), Providence, Rhode Island, 1997.

### **Symposium and Workshop Program Committee Member**

- Program Committee: Joint Workshop on Intelligent Narrative Technologies and Intelligent Cinematography and Editing, Edmonton, Canada, 2018.
- Program Committee: Workshop on Intelligent Conversation Agents in Home and Geriatric Care Applications, Stockholm, 2018.
- Program Committee: Thirteenth Workshop on Innovative User of NLP for Building Educational Applications, New Orleans, 2018.
- Program Committee: CHI-2018 Workshop on Data-Driven Educational Game Design, Montreal, 2018.

- Program Committee: Tenth Workshop on Intelligent Narrative Technologies (INT10), Snowbird, Utah, 2017.
- Program Committee: Twelfth Workshop on Innovative User of NLP for Building Educational Applications, Copenhagen, 2017.
- Program Committee: Eleventh Workshop on Innovative Use of NLP for Building Educational Applications, San Diego, 2016.
- Program Committee: ITS-2016 Workshop on Supporting Dynamic Cognitive, Affective, and Metacognitive Processes, Zagreb, Croatia, 2016.
- Program Committee: ITS-2016 Workshop on Affect, Meta-Affect, Data, and Learning, Zagreb, Croatia, 2016.
- Program Committee: ITS-2016 Workshop on Workshop on Intelligent Support for Learning in Groups, Zagreb, Croatia, 2016.
- Program Committee: First International Workshop on Educational Robotics (WONDER-2015), Paris, 2015.
- Program Committee: Eighth Workshop on Intelligent Narrative Technologies (INT8), Santa Cruz, California, 2015.
- Program Committee: AIED-2015 Workshop on Should AI Stay Married to ED?“, Madrid, 2015.
- Program Committee: AIED-2015 Workshop on Intelligent Support for Learning in Groups, Madrid, 2015.
- Program Committee: Tenth Workshop on Innovative Use of NLP for Building Educational Applications, Denver, 2015.
- Program Committee: IEEE FG-2015 International Workshop on Context-Based Affect Recognition (CBAR-2015), Ljubljana, Slovenia, 2015.
- Program Committee: Third Workshop on Games and NLP (GAMNLP-2014), Raleigh, North Carolina, 2014.
- Program Committee: IVA-2014 Workshop on Affective Agents, Boston, 2014.
- Program Committee: Seventh Workshop on Intelligent Narrative Technologies (INT7), Milwaukee, Wisconsin, 2014.
- Program Committee: ITS-2014 Workshop on Intelligent Support for Learning in Groups, Honolulu, Hawaii, 2014.
- Program Committee: ITS-2014 Workshop on AI-supported Education for Computer Science, Honolulu, Hawaii, 2014.
- Program Committee: Second Workshop on Games and NLP (GAMNLP-2013), Boston, 2013.
- Program Committee: Sixth Workshop on Intelligent Narrative Technologies (INT6), Boston, 2012.
- Program Committee: AIED-2013 Workshop on Scaffolding in Open-Ended Learning Environments, Memphis, 2013.
- Program Committee: AIED-2013 Workshop on Simulated Learners, Memphis, 2013.
- Program Committee: AIED-2013 GIFT Workshop on Recommendations for Authoring, Instructional Strategies and Analysis for Intelligent Tutoring Systems (ITS): Toward the Development of a Generalized Intelligent Framework for Tutoring (GIFT), Memphis, 2013.
- Program Committee: AIED-2013 Workshop on Self-Regulated Learning in Educational Technologies: Supporting, Modeling, Evaluating, and Fostering Metacognition with Computer-based Learning Environments, Memphis, 2013.



- Program Committee: AIED-2013 Workshop on AI-supported Education for Computer Science, Memphis, 2013.
- Program Committee: AIIDE-2013 Workshop on AI for Serious Games, Stanford, 2012.
- Program Committee: Fifth Workshop on Intelligent Narrative Technologies (INT5), Stanford, 2012.
- Program Committee: ITS-2012 Workshop on Self-Regulated Learning in Educational Technologies, Crete, 2012.
- Program Committee: ITS-2012 Workshop on Intelligent Support for Learning in Groups, Crete, 2012.
- Program Committee: ITS-2012 Workshop on Emotion in Games for Learning, Crete, 2012.
- Program Committee: NAACL-HLT Workshop on Computational Linguistics for Literature, Montreal, 2012.
- Program Committee: AAMAS-2012 Workshop on Emotional and Empathetic Agents Workshop, Valencia, 2012.
- Program Committee: EC-TEL Workshop on Technology-Enhanced Learning for Math and Science, Palermo, Italy, 2011.
- Program Committee: Thirteenth European Workshop on Natural Language Generation (ENLG-2011), Nancy, France, 2011.
- Program Committee: Fourth Workshop on Intelligent Narrative Technologies (INT4), Stanford, 2011.
- Organizing Committee: AAI Fall Symposium on Question Generation, Washington, D.C., 2011.
- Organizing Committee: AAI Fall Symposium on Cognitive and Metacognitive Educational Systems, Washington, D.C., 2010.
- Steering Committee: ITS-2010 Workshop on Question Generation, Pittsburgh, PA, 2010.
- Program Committee: FDG-2010 Workshop on Intelligent Narrative Technologies, Monterey, California, 2010.
- Program Committee: MOG-2010 Workshop on Multimodal Output Generation, Dublin, 2010.
- Organizing Committee: AAI Fall Symposium on Cognitive and Metacognitive Educational Systems, Washington, D.C., 2009.
- Program Committee: AIED 2009 Workshop on Closing the Affective Loop, Brighton, UK, 2009.
- Program Committee: AIED 2009 Workshop on Educational Games, Brighton, UK, 2009.
- Organizing Committee: NSF Workshop on the Question Generation Shared Task and Evaluation Challenge, Arlington, VA, 2008.
- Program Committee: AAI Spring Symposium on Narrative Technologies II, Stanford, 2008.
- Program Committee: ECAI 2008 Workshop on Integrating Embodied Conversational Agents with Speech and Advanced Dialogue Modeling, Patras, Greece, 2008.
- Program Committee: ITS 2008 Workshop on Emotional and Cognitive Issues in ITS, Montreal, 2008.
- Program Committee: AAI Fall Symposium on Intelligent Narrative Technologies, Arlington, VA, November 2007.
- Program Committee: AAI 2007 Workshop on Preference Handling for Artificial Intelligence, Vancouver, 2007.
- Program Committee: AAMAS 2007 Workshop on Agent-Based Systems for Human Learning and Entertainment, Honolulu, 2007.

- Program Committee: AIED 2007 Workshop on Narrative Learning Environments, Marina del Rey, CA, 2007.
- Program Committee: First IEEE International Workshop on Digital Game and Intelligent Toy-Enhanced Learning, Jhongli, Taiwan, 2007.
- Program Committee: AAMAS 2006 Workshop on Agent-Based Systems for Human Learning, Hakodate, Japan, 2006.
- Program Committee: AAMAS 2006 Workshop on Agent-Based Human Learning, Hakodate, Japan, 2006.
- Program Committee: ITS 2006 Workshop on Motivation and Affect in Intelligent Tutoring Systems, Jhongli, Taiwan, 2006.
- Program Committee: ITS 2006 Workshop on Teaching with Agents and Robots, Jhongli, Taiwan, 2006.
- Program Committee: AI-ED 2005 Workshop on Motivation, Emotions and Affect in Educational Software, Amsterdam, 2005.
- Program Committee: AI-ED 2005 Workshop on Educational Games as Intelligent Learning Environments, Amsterdam, 2005.
- Program Committee: AAMAS 2005 Workshop on Agent-Based Systems for Human Learning, Utrecht, The Netherlands, 2005.
- Program Committee: Third International Workshop on Narrative and Interactive Learning Environments (NILE-2004), Edinburgh, Scotland, 2004.
- Program Committee: Advanced Visual Interfaces 2004 Workshop on How Human-Like Should an Intelligent Interface Be?, Gallipoli, Italy, 2004.
- Program Committee: Fourth International Working Conference on Intelligent Virtual Agents (IVA-2003), Irsee, Germany, 2003.
- Program Committee: Second International Symposium on Smart Graphics (Smart Graphics 2002), IBM T. J. Watson Research Center, Hawthorne, NY, 2002.
- Program Committee: Second International Workshop on Narrative and Interactive Learning (NILE-2002) Environments, Edinburgh, Scotland, 2002.
- Program Committee: Agents 2001 Workshop on Representing, Annotating, and Evaluating Non-Verbal and Verbal Communicative Acts to Achieve Contextual Embodied Agents, Montreal, 2001.
- Program Committee: First International Symposium on Smart Graphics (Smart Graphics 2001), IBM T. J. Watson Research Center, Hawthorne, NY, 2001.
- Program Committee: AAAI Symposium on Plan Acquisition for Intelligent Software Agents: Learning How to Do Things, Cape Cod, MA, 2000.
- Program Committee: AAAI Fall Symposium on Building Dialogue Systems for Tutorial Applications, Cape Cod, MA, 2000.
- Organizing Committee and Program Committee: Agents 2000 Workshop on Achieving Human-Like Behavior in Interactive Animated Agents, Barcelona, Spain, 2000.
- Program Committee: Agents 2000 Workshop on Communicative Agents in Intelligent Virtual Environments, Barcelona, Spain, 2000.
- Program Committee: INLG-2000 Workshop on Natural Language Generation Workshop on Coherence in Generated Multimedia, Mitzpe Ramon, Israel, 2000.
- Program Committee: AAAI Spring Symposium on Smart Graphics, Stanford, 2000.

- Organizing Committee: IUI-2000 Workshop on Using Plans in Intelligent User Interfaces, New Orleans, 2000.
- Program Committee: AAAI Fall Symposium on Narrative Intelligence, Cape Cod, MA, 1999.
- Program Committee: AI-ED 1999 Workshop on Instructional Uses of Animated and Personified Agents, Le Mans, France, 1999.
- Program Committee: Fifteenth Twente Workshop on Language Technology: Interactions in Virtual Worlds, University of Twente, Enschede, The Netherlands, 1999.
- Program Committee: Agents 1999 Workshop on Communicative Agents: The Use of Natural Language in Embodied Systems, Seattle, 1999.
- Program Committee: ECAI-1998 (European Conference on Artificial Intelligence) Workshop on AI/ALife and Entertainment, Brighton, UK, 1998.
- Program Committee: Fifth International Workshop on Agent Theories, Architectures, and Languages (ATAL-1998), Paris, France, 1998.
- Organizing Committee: AAAI-98 Workshop on Representations for Multi-modal Human-Computer Interaction, Madison, Wisconsin, 1998.
- Organizing Committee and Program Committee: IJCAI-97 Agents Workshop on Animated Interface Agents: Making Them Intelligent, Nagoya, Japan, 1997.
- Program Committee: Fourth International Workshop on Agent Theories, Architectures, and Languages (ATAL-1997), Providence, Rhode Island, 1997.
- Organizing Committee: NIST Workshop on Education and Training Technology, Washington, DC, 1996.

### **Journal Reviewer**

- *IEEE Transactions on Learning Technologies*, 2018.
- *IEEE Transactions on Learning Technologies*, 2017.
- *Human-Computer Interaction*, 2017.
- *Artificial Intelligence Review*, 2016.
- *Educational Psychologist*, 2016.
- *IEEE Transactions on Learning Technologies*, 2015.
- *Educational Psychologist*, 2015.
- *IEEE Transactions on Computational Intelligence and AI in Games*, 2015.
- *Artificial Intelligence*, 2014.
- *Human-Computer Interaction*, 2014.
- *Interacting with Computers*, 2014.
- *ACM Transactions on Interactive Intelligent Systems*, 2013.
- *Artificial Intelligence*, 2013.
- *International Journal of Artificial Intelligence in Education*, 2013.
- *Human-Computer Interaction*, 2012.
- *IEEE Transactions on Learning Technologies*, 2012.
- *Computer Speech and Language*, 2012.

- *Human-Computer Interaction*, 2011.
- *Presence*, 2011.
- *IEEE Transactions on Learning Technologies*, 2011.
- *International Journal of Human-Computer Studies*, 2011.
- *IEEE Transactions on Affective Computing*, 2011.
- *International Journal of Human-Computer Studies*, 2010.
- *IEEE Transactions on Affective Computing*, 2010.
- *Journal of Multimodal User Interfaces*, 2010.
- *User Modeling and User-Adapted Interaction*, 2010.
- *Journal of Ambient Intelligence and Smart Environments*, 2010.
- *Natural Language Engineering*, 2009.
- *Journal of Media Psychology*, 2009.
- *Journal of Educational Technology & Society*, 2009.
- *IEEE Transactions on Computational Intelligence and AI in Games*, 2009.
- *Autonomous Agents and Multiagent Systems*, 2009.
- *International Journal of Human-Computer Studies*, 2009.
- *IEEE Transactions on Learning Technologies*, 2008.
- *International Journal of Artificial Intelligence in Education*, 2008.
- *Journal of Game Development*, 2008.
- *International Journal of Artificial Intelligence in Education*, 2007.
- *International Journal of Learning Technology*, 2007.
- *Journal of Natural Language Engineering*, 2007.
- *User Modeling and User-Adapted Interaction*, 2006.
- *International Journal of Human-Computer Studies*, 2006.
- *Knowledge-Based Systems*, 2006.
- *Journal of Artificial Intelligence*, 2005.
- *User Modeling and User-Adapted Interaction*, 2005.
- *International Journal of Artificial Intelligence in Education*, 2004.
- *International Journal of Artificial Intelligence in Education*, 2002.
- *Journal for Visualization and Computer Animation*, 2002.
- *Computational Linguistics*, 2001.
- *User Modeling and User-Adapted Interaction*, 2000.
- *International Journal of Artificial Intelligence in Education*, 2000.
- *User Modeling and User-Adapted Interaction*, 1999.
- *AI Communications: The European Journal on Artificial Intelligence*, 1999.

- *International Journal of Human-Computer Studies*, 1999.
- *Autonomous Agents and Multiagent Systems*, 1998.
- *Applied Artificial Intelligence*, 1998.
- *International Journal of Expert Systems*, 1995.

### **Conference Reviewer**

- Eighteenth ACM International Conference on Multimodal Interaction (ICMI-2016), Tokyo, 2016.
- Seventeenth ACM International Conference on Multimodal Interaction (ICMI-2015), Seattle, 2015.
- ACM Conference on Creativity + Cognition, Glasgow, 2015.
- Forty-Ninth Annual Meeting of the Association for Computational Linguistics – Human Language Technologies (ACL-HLT 2011), Portland, Oregon, 2011.
- Annual Meeting of the American Educational Research Association (AERA-2011), New Orleans, 2011.
- Twenty-Third International Conference on Computational Linguistics (COLING-2010), Beijing, China, 2010.
- Eleventh Annual Conference of the North American Chapter of the Association for Computational Linguistics (NAACL-HLT 2010), Los Angeles, 2010.
- Annual Meeting of the American Educational Research Association (AERA-2010), Denver, 2010.
- Twelfth Annual Visualization Symposium (EuroVis-2010), Bordeaux, France, 2010
- National Conference of the North American Association for Computational Linguistics – Human Language Technologies (NAACL-HLT-2009), Boulder, Colorado, 2009.
- 2008 International Conference on Intelligent User Interfaces (IUI-2008), Canary Islands, Spain, 2008.
- Twenty-Fifth SIGCHI Conference on Human Factors in Computing Systems – CHI Notes (CHI-2007), San Jose, 2007.
- Twentieth International Conference on Artificial Intelligence (IJCAI-2007), Hyderabad, India, 2007.
- Nineteenth International Joint Conference on Artificial Intelligence (IJCAI-2005), Edinburgh, 2005.
- Seventeenth Annual ACM Symposium on User Interface Software and Technology (UIST-2004), Santa Fe, 2004.
- Thirty-Ninth Annual Meeting of the Association for Computational Linguistics (ACL-2001), Toulouse, France, 2001.
- National Conference of the North American Association for Computational Linguistics (NAACL-2000), Seattle, 2000.
- Graphics Interface 2000, Montreal, 2000.
- Twenty-sixth International Conference on Computer Graphics and Interactive Techniques (SIGGRAPH-1999), Los Angeles, 1999.
- Twenty-First Cognitive Science Society Conference (CogSci-1999), Vancouver, 1999.
- Third International Conference on the Learning Sciences (ICLS-1998), Atlanta, 1998.
- Fourth International Conference on Intelligent Tutoring Systems (ITS-1998), San Antonio, 1998.
- East-West Conference on Human-Computer Interaction, Moscow, 1995.

## **Grant Proposal Reviewer – International**

- Computer Science Evaluation Group, Natural Sciences and Engineering Research Council of Canada (NSERC), 2010-12.
- UK Engineering and Physical Sciences Research Council, 2011.
- Natural Sciences and Engineering Research Council of Canada: 2009, 2010.
- Natural National Science Foundation of China / Research Grants Council of Hong Kong, 2005.

## **Grant Proposal Reviewer – US**

- National Institutes of Health (NIH): 2018 (2 panels).
- National Research Council (NRC), 1997.
- National Science Foundation (NSF): 1997 (1 panel), 1998 (2 panels), 1999 (1 panel), 2005 (1 panel), 2007 (2 panels), 2008 (2 panels), 2009 (3 panels), 2010 (2 panels), 2011 (7 panels), 2012 (4 panels), 2013 (1 panel), 2014 (1 panel), 2015 (1 panel), 2016 (4 panels), 2017 (1 panel), 2018 (3 panels).
- U.S. Army, 2009.

## **Courses Taught**

### **Undergraduate Courses**

- Introduction to Programming (CSC116): fall 2005, spring 2006, spring 2007, spring 2008.
- Programming Concepts (CSC210): fall 1996.
- Data Structures for Computer Scientists (CSC316): fall 2004, spring 2006.
- Introduction to Artificial Intelligence (CSC411): spring 1997, spring 1999, spring 2004, summer 2006, summer 2007.
- Intelligent Game-Based Learning Environments (CSC495): spring 2013, spring 2014, spring 2016.

### **Graduate Courses**

- Artificial Intelligence I (CSC520): fall 1994, fall 1995, fall 1997, fall 1998, fall 1999, fall 2005, fall 2006, fall 2007, fall 2009.
- Multimedia Interface Design (CSC591D): fall 1995.
- Knowledge-Based Learning Environments (CSC591E): fall 1995, fall 1996.
- Intelligent Game-Based Learning Environments (CSC591): fall 2010, spring 2013, spring 2014, spring 2016.
- Intelligent Multimedia Systems (CSC725): fall 1994, spring 1998, spring 2001, spring 2005.
- Natural Language Processing (CSC791T): fall 2006, fall 2008.
- Natural Language Dialogue Systems (CSC791J): fall 2007.