

JOHN E. LAIRD
ELECTRICAL ENGINEERING AND COMPUTER SCIENCE DEPARTMENT
COLLEGE OF ENGINEERING
UNIVERSITY OF MICHIGAN
2260 HAYWARD
ANN ARBOR, MI 48109-2121
FEBRUARY 2017

RESEARCH INTERESTS

- Cognitive Architecture and Human-level Artificial Intelligence

EDUCATION

- Ph.D. (Computer Science) 1983, Carnegie Mellon University
Thesis title: Universal Subgoaling. Thesis advisor: Prof. Allen Newell
- M.S. (Computer Science) 1978, Carnegie Mellon University
- B.S. with High Distinction (Communication and Computer Sciences) 1975,
University of Michigan

PROFESSIONAL EMPLOYMENT

- Interim Chair, University of Michigan, Computer Science and Engineering, Spring 2011
- Chairman of the Board, Soar Technology, Inc., 2009 – present
- Associate Chair, University of Michigan,
Department of Electrical Engineering and Computer Science, 2000 – 2004
- Professor, University of Michigan,
Department of Electrical Engineering and Computer Science, 1998 – present
- Associate Professor, University of Michigan,
Department of Electrical Engineering and Computer Science, 1992 – 1998
- Assistant Professor, University of Michigan,
Department of Electrical Engineering and Computer Science, 1986 – 1992
- Member of Research Staff, Xerox Corporation, Palo Alto Research Center,
Intelligent Systems Laboratory, 1984 – 1986

AWARDS AND HONORS

- Fellow of the American Association for the Advancement of Science (AAAS), 2012
- John L. Tishman Professor of Engineering, University of Michigan, 2008 – present
- Fellow of Cognitive Science Society, 2008
- Fellow of the ACM, 2007
- Service Excellence Award, University of Michigan, College of Engineering, 2006
- Research Excellence Award, University of Michigan, College of Engineering, 1999
- Honorable Mention for Tau Beta PI Teacher of the Year Award, 1999
- Department Service Award, Electrical Engineering and Computer Science, 1998
- Fellow of the Association for the Advancement of Artificial Intelligence, 1995
- Department Research Award, Electrical Engineering and Computer Science, 1993
- Phi Beta Kappa, University of Michigan, 1976
- Angell Scholar, University of Michigan, 1973, 1974
- Branstrom Scholar, University of Michigan, 1973
- Regent Scholar, University of Michigan, 1972

PUBLICATIONS

Doctoral Dissertation

1. Laird, J. E. (1983). *Universal Subgoalng*. Carnegie Mellon University. (Available in Laird, J. E., Rosenbloom, P. S., Newell, A. (1986). *Universal Subgoalng and Chunking: The Automatic Generation, Learning of Goal Hierarchies*. Hingham, MA: Kluwer, 1986.)

Books and Proceedings:

1. Laird, J. E. (2012). *The Soar Cognitive Architecture*. MIT Press, Cambridge, MA.
2. Lewis, R.L., Polk, T. A., Laird, J. E. (Eds.) (2007). *The Proceedings of the 8th International Conference on Cognitive Modeling*. Psychology Press/ Taylor & Francis.
3. Laird, J. E., Schaeffer, J. (Eds.) (2006). *Proceedings of the Second Artificial Intelligence and Interactive Digital Entertainment Conference*, AAAI Press, Menlo Park, CA.
4. Young, R. M., Laird, J. E., (Eds.) (2005). *Proceedings of the First Artificial Intelligence and Interactive Digital Entertainment Conference*, AAAI Press, Menlo Park, CA.
5. Rosenbloom, P. S., Laird, J. E., Newell, A. (1993). *Soar Papers: Research on Integrated Intelligence*, MIT Press, Boston, MA.
6. Laird, J. E. (Editor). (1988). *Fifth International Conference on Machine Learning*. Morgan Kaufmann, Los Altos, CA.
7. Laird, J. E., Rosenbloom, P. S., Newell, A. (1986). *Universal Subgoalng and Chunking: The Automatic Generation, Learning of Goal Hierarchies*. Hingham, MA: Kluwer, 1986.

Archival Journals:

1. Kirk, J., Laird, J. E. (2014). Interactive task learning for simple games. *Advances in Cognitive Systems* 3, 11-28.
2. Mohan, S., Mininger, A. and Laird, J. E. (2014). Towards an Indexical model of situated comprehension for real-world cognitive agents. *Advances in Cognitive Systems* 3, 163-182.
3. Laird, J. E., Mohan, S. (2014). A case study of knowledge integration across multiple memories in Soar. *Biologically Inspired Cognitive Architectures*, 8, 93-99.
4. Derbinsky, N., Laird, J. E. (2013). Effective and efficient forgetting of learned knowledge in Soar's working and procedural memories, *Cognitive Systems Research*, 24, 104-113.
5. Mohan, S., Mininger, A., Kirk, J. and Laird, J. E. (2012). Acquiring Grounded Representations of Words with Situated Interactive Instruction, *Advances in Cognitive Systems*, 2, Palo Alto, California.
6. Laird, J. E., Derbinsky, N., Tinkerhess, M. (2012). Online Determination of Value-Function Structure and Action-value Estimates for Reinforcement Learning in a Cognitive Architecture, *Advances in Cognitive Systems*, 2, Palo Alto, California.
7. Nuxoll, A. M., Laird, J. E. (2012), Enhancing Intelligent Agents with Episodic Memory, *Cognitive Systems Research*, (17-18), 34-48.
8. Lathrop, S. D., Wintermute, S., Laird, J. E. (2011), Exploring the Functional Advantages of Spatial and Visual Cognition from an Architectural Perspective. *Topics in Cognitive Science*, Special issue on Modeling Spatial Cognition, 3, 796-818.
9. Gorski, N. A., Laird, J. E. (2011), Learning to Use Episodic Memory. *Cognitive Systems Research*, 12(2), 144-153.
10. Langley, P., Laird, J. E., Rogers, S. (2009). Cognitive architectures: Research issues and challenges. *Cognitive Systems Research*, 10(2), 141-160.
11. Marinier, R. P., Laird, J. E., Lewis, R. L., (2009). A Computational Unification of Cognitive Behavior and Emotion, *Cognitive Systems Research*, 10(1), 48-69.

12. Konik, T., Laird, J. (2006). Learning Goal Hierarchies from Structured Observations and Expert Annotations, *Machine Learning*, 64(1-3), 263-287.
13. Pearson, D. J., Laird, J. E. (2005). Incremental Learning of Procedural Planning Knowledge in Challenging Environments, *Computational Intelligence*, 21:4, 414-439.
14. Nason, S., Laird, J. E. (2005). Soar-RL: Integrating Reinforcement Learning with Soar, *Cognitive Systems*, 6 (1), 51-59.
15. Wray, R.E., Laird, J. E. (2003). An Architectural Approach to Ensuring Consistency in Hierarchical Execution, *Journal of Artificial Intelligence Research*, 19, 355-398.
16. Laird, J. E., Jones, R. M., Nielsen, P. E. (1998). Knowledge-Based Multiagent Coordination, *Presence*, 7(6), 547-563.
17. Laird, J. E., Pearson, D. J., Huffman, S. B. (1997). Knowledge-directed Adaptation in Multi-level Agents. *Journal of Intelligent Information Systems*, 9(3), 261-276.
18. Miller, C. S., Laird, J. E. (1996). Accounting for Graded Performance within a Discrete Search Framework, *Cognitive Science*, 20 (4), 499-537.
19. Huffman, S. B., Laird, J. E. (1995). Flexibly Instructable Agents, *Journal of Artificial Intelligence Research*, 3, 271-324.
20. Wray, R. E., Chong, R., Phillips, J., Rogers, S., Walsh, W., Laird, J. E. (1995). Organizing Information in Mosaic: A Classroom Experiment, *Computer Networks, ISDN Systems*, 28, 167-178.
21. Pearson, D. J., Huffman, S. B., Willis, M. B., Laird, J. E., Jones, R. M. (1993). A Symbolic Solution to Intelligent Real-Time Control, *Robotics and Autonomous Systems*, 11, 279-291.
22. Rosenbloom, P. S., Laird, J. E. (1993). On Unified Theories of Cognition.- A Response to the Reviews, *Artificial Intelligence*, 59 (1-2), 389-413.
23. Rosenbloom, P. S., Laird, J. E., Newell, A., McCarl, R., (1991). A Preliminary Analysis of the Foundations of Soar. *Artificial Intelligence* 47(1-3), 289-325.
24. Laird, J. E., Hucka, M., Yager, E. S., Tuck, C. M. (1991). Robo-Soar: An Integration of External Interaction, Planning, Learning using Soar. *Robotics and Autonomous Systems*, 8, 113-129.
25. Laird, J. E., Newell, A., Rosenbloom, P. S. (1987). Soar: An Architecture for General Intelligence. *Artificial Intelligence*, 33(3), 1-64.
26. Laird, J. E., Rosenbloom, P. S., Newell, A., (1986). Chunking in Soar: The Anatomy of a General Learning Mechanism. *Machine Learning*, 1(1), 11-46.
27. Rosenbloom, P. S., Laird, J. E., McDermott, J., Newell, A., Orciuch, E. (1985). Soar: An Experiment in Knowledge-Intensive Programming in a Problem-Solving Architecture. *IEEE Transactions on Pattern Analysis, Machine Intelligence*, 7(5), 561-569.

Archival Magazines:

1. Wray, R. E., Laird, J. E., Nuxoll, A., Stokes, D., Kerfoot, A. (2005). Synthetic Adversaries for Urban Combat Training, *AI Magazine*, 26(3):82-92, (invited).
2. Laird, J. E. (2002). Research in Human-level AI using Computer Games, *Communications of the ACM*, 45(1), 32-35, (invited).
3. Laird, J. E. (2001). Using a Computer Game to Develop Advanced AI. *Computer*, 34(7), 70-75, (invited).
4. Laird, J. E., van Lent, M. (2001). Interactive Computer Games: Human-level AI's Killer Application. *AI Magazine*, 22(2), 15-25, (invited).
5. Jones, R. M., Laird, J. E., Nielsen P. E., Coulter, K., Kenny, P., & Koss, F. (1999). Automated Intelligent Pilots for Combat Flight Simulation, *AI Magazine*, 20(1), 27-42.
6. Tambe, M., Johnson, W. L., Jones, R. M., Koss, F., Laird, J. E., Rosenbloom, P. S., Schwamb, K. (1995). Intelligent Agents for Interactive Simulation Environments, *AI Magazine*, 16(1), 15-39.

7. Laird, J. E., Rosenbloom, P. S. (1993). In pursuit of mind: The research of Allen Newell, *AI Magazine*, 19-45, (invited).

Rigorously Refereed Conference Proceedings with Low Acceptance Rates:

1. Kirk, J., Mininger, A., Laird, J. (2016). Learning task goals interactively with visual demonstrations. Proceedings of the International Conference on Biologically Inspired Cognitive Architectures. New York, New York, 2016.
2. Jones, S. J., Wandzel, A. R., Laird, J. E. (2016). Efficient Computation of Spreading Activation Using Lazy Evaluation. Proceedings of the 14th International Conference on Cognitive Modeling (ICCM). University Park, Pennsylvania
3. Lindes, P., and Laird, J. E. (2016). Toward Integrating Cognitive Linguistics and Cognitive Language Processing. Proceedings of the 14th International Conference on Cognitive Modeling (ICCM). University Park, Pennsylvania.
4. Kirk, J., and Laird, J. E. (2016). Learning General and Efficient Representations of Novel Games through Interactive Instruction. In Proceedings of the Fourth Annual Conference on Advances in Cognitive Systems.
5. Mininger, A., & Laird, J. E. (2016). Interactively Learning Strategies for Handling References to Unseen or Unknown Objects. In Proceedings of the Fourth Annual Conference on Advances in Cognitive Systems.
6. Li, J., and Laird, J. E. (2015). Spontaneous Retrieval for Prospective Memory: Effects of Encoding Specificity and Retention Interval. In *Proceedings of the 13th International Conference on Cognitive Modeling (ICCM)*. Groningen, The Netherlands.
7. Li, J., and Laird, J. E. (2015). Spontaneous Retrieval from Long-Term Memory in a Cognitive Architecture. In *Proceedings of the 29th AAAI Conference on Artificial Intelligence (AAAI)*. Austin, TX.
8. Mohan, S., Laird J. E. (2014). Learning goal-oriented hierarchical tasks from situated interactive instruction. *Proceedings of the 28th AAAI Conference on Artificial Intelligence (AAAI)*.
9. Kirk, J., Laird J. E. (2013). Learning Task Formulations through Situated Interactive Instruction. *Proceedings of the Second Conference on Advances in Cognitive Systems*. Baltimore, MD.
10. Mohan, S., Mininger, A., Laird J. E. (2013). Towards an Indexical Model of Situated Language Comprehension for Real-World Cognitive Agents. *Proceedings of the Second Conference on Advances in Cognitive Systems*. Baltimore, MD.
11. Mohan, S., Kirk, J., Laird, J. E. (2013). A Computational Model of Situated Task Learning with Interactive Instruction. *Proceedings of the 12th International Conference on Cognitive Modeling*. Ottawa, Canada
12. Li, J., Laird, J. E. (2013). The Computational Problem of Prospective Memory. *Proceedings of the 17th International Conference on Cognitive Modeling*. Ottawa, Canada
13. Li, J., Laird, J. E. (2013) Preemptive Strategies for Overcoming the Forgetting of Goals, *Proc. of the 27th AAAI Conference on Artificial Intelligence (AAAI)*.
14. Xu, J., Laird, J. E. (2013) Learning Integrated Symbolic and Continuous Action Models for Continuous Domains. *Proc. of the 27th AAAI Conference on Artificial Intelligence (AAAI)*.
15. Derbinsky, N., Li, J., and Laird, J. E. (2012) A Multi-Domain Evaluation of Scaling in a General Episodic Memory. *Proc. of the 26th AAAI Conference on Artificial Intelligence (AAAI)*. Toronto, Canada.

16. Li, J., Derbinsky, N., and Laird, J. E. (2012) Functional Interactions between Memory and Recognition Judgments. *Proc. of the 26th AAAI Conference on Artificial Intelligence (AAAI)*. Toronto, Canada.
17. Mohan, S. and Laird, J. E. (2012) Exploring Mixed-Initiative Interaction for Learning with Situated Instruction in Cognitive Agents, In *Proceedings of the 26th AAAI Conference on Artificial Intelligence*, 2012. (Extended Abstract).
18. Derbinsky, N., and Laird, J. E. (2012) Competence-Preserving Retention of Learned Knowledge in Soar's Working and Procedural Memories. *Proc. of the 11th International Conference on Cognitive Modeling (ICCM)*. Berlin, Germany.
19. Derbinsky, N., and Laird, J. E. (2012) Computationally Efficient Forgetting via Base-Level Activation. *Proc. of the 11th International Conference on Cognitive Modeling (ICCM)*. Berlin, Germany. Best Poster Award.
20. Derbinsky, N., Li, J., and Laird, J. E. (2012) Algorithms for Scaling in a General Episodic Memory (Extended Abstract). *Proc. of the 11th International Conference on Autonomous Agents and Multiagent Systems (AAMAS)*. Valencia, Spain.
21. Xu, J. Z., and Laird, J. E. (2011). Combining Learned Discrete and Continuous Action Models. *Proceedings of the 25th National Conference on Artificial Intelligence (AAAI)*. San Francisco, CA.
22. Derbinsky, N., and Laird, J. E. (2011). A Functional Analysis of Historical Memory Retrieval Bias in the Word Sense Disambiguation Task. *Proceedings of the 25th National Conference on Artificial Intelligence (AAAI)*. San Francisco, CA.
23. Wang, Y., and Laird, J.E. (2010). Efficient Value Function Approximation with Unsupervised Hierarchical Categorization for a Reinforcement Learning Agent, *the 2010 International Conference on Intelligent Agent Technology* (Best Paper Award nomination).
24. Wang, Y., and Laird, J.E. (2010). A Computational Model of Functional Category Learning in a Cognitive Architecture, In *Proceedings of the Tenth International Conference on Cognitive Modeling*
25. Laird, J. E., Xu, J. Z., and Wintermute, S. (2010). Using Diverse Cognitive Mechanisms for Action Modeling, *Proceedings of the Tenth International Conference on Cognitive Modeling*, Philadelphia, PA
26. Derbinsky, N., Laird, J. E., and Smith, B. (2010) Towards Efficiently Supporting Large Symbolic Declarative Memories, *Proceedings of the Tenth International Conference on Cognitive Modeling*, Philadelphia, PA.
27. Xu, J. Z. and Laird, J. E. (2010). Instance-based Online Learning of Deterministic Relational Action Models, *Proceedings of the Twenty-Fourth Conference on Artificial Intelligence, AAAI-2010*, Atlanta, GA.
28. Laird, J. E., Wray, R. E. III (2010). Cognitive Architecture Requirements for Achieving AGI, *Proceedings of the Third Conference on Artificial General Intelligence*.
29. Derbinsky, N., Laird, J. E. (2009), Efficiently Implementing Episodic Memory, *Proceedings of the International Conference on Case-based Reasoning*.
30. Gorski, N.A., Laird, J.E. (2009). Learning to Use Episodic Memory. *Proceedings of the Ninth International Conference on Cognitive Modeling*. Manchester, UK.
31. Wintermute, S., and Laird, J. E. (2009). Imagery as Compensation for an Imperfect Abstract Problem Representation. *Proceedings of the 31st Annual Conference of the Cognitive Science Society*.
32. Lathrop, S. D., Laird, J. E. (2009). Extending Cognitive Architectures with Mental Imagery, *Proceedings of the Second Conference on Artificial General Intelligence*.

33. Laird, J. E., Wray, R. E. III, Marinier, R. P. III, Langley, P. (2009). Claims and Challenges in Evaluating Human-Level Intelligent Systems, *Proceedings of the Second Conference on Artificial General Intelligence*.
34. Wintermute, S., Laird, J. E. (2008). Bimodal Spatial Reasoning with Continuous Motion. *Proceedings of the Twenty-Third AAAI Conference on Artificial Intelligence*. Chicago, IL.
35. Laird, J. E. (2008). Extending the Soar Cognitive Architecture. *Proceedings of the First Artificial General Intelligence Conference*, Memphis, TN.
36. Marinier, R. P. III, Laird, J. E. (2008). Emotion-Driven Reinforcement Learning, *Proceedings of the 30th Annual Conference of the Cognitive Science Society*.
37. Marinier, R.P., Laird, J.E. (2007). Computational Modeling of Mood and Feeling from Emotion. *Proceedings of the 29th Annual Conference of the Cognitive Science Society*.
38. Nuxoll, A. M., and Laird, J. E. (2007). Extending Cognitive Architecture with Episodic Memory. *Proceedings of the 21st National Conference on Artificial Intelligence*.
39. Wang, Y., and Laird, J.E. (2007). The Importance of Action History in Decision Making and Reinforcement Learning. *Proceedings of the Eighth International Conference on Cognitive Modeling*. Ann Arbor, MI.
40. Lathrop, S.D., and Laird, J.E. (2007). Towards Incorporating Visual Imagery into a Cognitive Architecture. *Proceedings of the Eighth International Conference on Cognitive Modeling*. Ann Arbor, MI.
41. Wintermute, S., and Laird, J. E. (2007). Predicate Projection in a Bimodal Spatial Reasoning System. *Proceedings of the 21st National Conference on Artificial Intelligence*, Vancouver, B.C., Canada.
42. Wintermute, S., Xu, J., and Laird, J.E. (2007). SORTS: A Human-Level Approach to Real-Time Strategy AI. *Proceedings of the Third Artificial Intelligence and Interactive Digital Entertainment Conference*, Stanford, California.
43. Wray, R. E., Laird, J. E., Nuxoll, A., Stokes, D., Kerfoot, A. (2004). Synthetic Adversaries for Urban Combat Training, *Proceedings of the Conference on Innovative Applications of Artificial Intelligence*.
44. Magerko, B., Laird, J. E., Assanie, M., Kerfoot, A., Stokes, D., (2004) AI Characters and Directors for Interactive Computer Games, *Proceedings of the Conference on Innovative Applications of Artificial Intelligence*.
45. Nuxoll, A., Laird, J. E. (2004). A Cognitive Model of Episodic Memory Integrated With a General Cognitive Architecture, *Proceedings of the Sixth International Conference on Cognitive Modeling*.
46. Marinier, R., Laird, J. E. (2004). Toward a Comprehensive Computational Model of Emotions, Feelings, *Proceedings of the Sixth International Conference on Cognitive Modeling*.
47. Nason, S., Laird, J. E. (2004). Soar-RL: Integrating Reinforcement Learning with Soar, *Proceedings of the Sixth International Conference on Cognitive Modeling*.
48. Pearson, D., Laird, J. E. (2004). Redux: Example-Driven Diagrammatic Tools for Rapid Knowledge Acquisition, *Proceedings of the Conference on Behavior Representation in Modeling and Simulation*, Washington, D.C. (Selected for Recommended Reading List.)
49. Wallace. S. A., Laird, J. E., (2003). Comparing Agents, Humans Using Behavioral Bounding. *Proceedings of the Conference on International Joint Conference on Artificial Intelligence*.
50. Magerko, B., Laird, J. E. (2003). Building an Interactive Drama Architecture with a High Degree of Interactivity. *Proceedings of the Conference on First International Conference on Technologies for Interactive Digital Storytelling, Entertainment*, Darmstadt, Germany.

51. Wray, R. E., Laird, J. E. (2003). Variability in Human Behavior Modeling for Military Simulations. *Proceedings of the Conference on Behavior Representation in Modeling, Simulation*, Scottsdale, AZ, May 2003. (Selected for Recommended Reading List.)
52. van Lent, M., Laird, J. E. (2001). Learning Procedural Knowledge through Observation. *Proceedings of the First International Conference on Knowledge Capture*.
53. Laird, J. E. (2001). It Knows What You're Going To Do: Adding Anticipation to a Quakebot. *Proceedings of the Conference on Agents*, Montreal, CA, 385-392.
54. Laird, J. E., van Lent, M. (2000). Interactive Computer Games: Human-level AI's Killer Application. *Proceedings of the National Conference on Artificial Intelligence*, 1171-1178.
55. van Lent, M., Laird, J. E. (1999). Learning Hierarchical Performance Knowledge by Observation. *Proceedings of the International Conference on Machine Learning*.
56. Wray, R. E., Laird, J. E. (1998). Maintaining Consistency in Hierarchical Reasoning, *Proceedings of the National Conference on Artificial Intelligence*, 928-935.
57. van Lent, M., Laird, J. E. (1999). Developing an Artificial Intelligence Engine, *Proceedings of the Game Developers Conference*, 577-588.
58. Jones, R. M., Laird, J. E., Nielsen P. E. (1999). Automated Intelligent Pilots for Combat Flight Simulation. *Proceedings of the Tenth Annual Conference on Innovative Applications of Artificial Intelligence*, 1047-1054.
59. Laird, J. E., Jones, R. M. (1998). Building Advanced Autonomous AI systems for Large Scale Real Time Simulation. *Proceedings of the Computer Game Developers Conference*, Long Beach, CA, 365-378.
60. Jones, R. M., Laird, J. E. (1997). Constraints on the design of a high-level model of cognition. *Proceedings of the Nineteenth Annual Conference of the Cognitive Science Society*.
61. Chong, R. S., Laird, J. E. (1997). Identifying Dual-Task Executive Process Knowledge using EPIC-Soar. *Proceedings of the Nineteenth Annual Conference on the Cognitive Science Society*.
62. Wray, R. E., Laird, J. E., Jones, R. M. (1996). Compilation of Non-Contemporaneous Constraints. *Proceedings of the Thirteenth National Conference on Artificial Intelligence*, 771-778.
63. Laird, J. E., Jones, R. M., Nielsen, P. E. (1995). Multiagent Coordination in Distributed Interactive Battlefield Simulations. *Proceedings of the First International Conference on Multiagent Systems*.
64. Huffman, S. B., Laird, J. E., (1994). Learning from highly flexible tutorial instruction, *Proceedings of the National Conference on Artificial Intelligence*, Seattle, WA.
65. Wray, R. E., Chong, R., Phillips, J., Rogers, S., Walsh, W., Laird J. E. (1994). Organizing Information in Mosaic: A Classroom Experiment. *Proceedings of the Second International World Wide Web Conference 1994: Mosaic, the Web*, Chicago, Illinois, 475-485.
66. Huffman, S. B., Laird, J. E. (1993). Learning Procedures from Interactive Natural Language Instructions. *Proceedings of the Tenth International Conference on Machine Learning*.
67. Huffman, S. B., Miller, C. S., Laird, J. E. (1993). Learning from instruction: A knowledge level capability within a unified theory of cognition. *Proceedings of the Fifteenth Annual Conference of the Cognitive Science Society*, 114-119.
68. Pearson, D. J., Huffman, S. B., Willis N. B., Laird, J. E., Jones, R. M. (1993). Intelligent Multi-Level Control in a Highly Reactive Domain. *Proceedings of the International Conference on Intelligent Autonomous Systems*.
69. Huffman, S. B., Laird, J. E. (1992). Dimensions of Complexity in Learning from Interactive Instruction. *Proceedings of the Cooperative Intelligent Robotics in Space III, SPIE* 1829.
70. Miller, C., Laird, J. E. (1991). A Constraint-Motivated Lexical Acquisition Model. *Proceedings of the 13th Annual Conference on the Cognitive Science Society*, 827-831.

71. Laird, J. E., Rosenbloom, P. S. (1990). Integrating Execution, Planning, Learning in Soar for External Environments. *Proceedings of the National Conference of Artificial Intelligence*, 1022-1029.
72. Lewis, R., Huffman, S., John, B., Laird, J. E., Lehman, J. F., Newell, A., Rosenbloom, P., Simon, T., Tessler, S. (1990). Soar as a Unified Theory of Cognition: Spring 1990. *Proceedings of the 12th Annual Conference of the Cognitive Science Society*, 1035-1042.
73. Wiesmeyer, M., Laird, J. E. (1990). A Computer Model of Visual Attention. *Proceedings of the 12th Annual Conference of the Cognitive Science Society*, 582-589.
74. Laird, J. E., Hucka, M., Yager, E. S., Tuck, C. M. (1990). Correcting, Extending Domain Knowledge using Outside Guidance. *Proceedings of the Seventh International Conference on Machine Learning*, 235-243.
75. Levine, S. P., Laird, J. E., Kirsch, N. L., (1989). Expert Systems for Guidance of Cognitively Impaired People Performing Daily Living Activities. *Invited paper, Annual International Conference of the IEEE Engineering in Medicine, Biology Society*, 1802-1803.
76. Laird, J. E., Yager, E. S., C. Tuck, Hucka, M. (1989). Learning in Tele-autonomous Systems. *Proceedings of the Conference on Space TeleRobotics*, Pasadena, CA, Vol III, 415-424.
77. Laird, J. E. (1988). Recovery from Incorrect Knowledge in Soar. *Proceedings of the National Conference on Artificial Intelligence*, 618-623.
78. Rosenbloom, P. S., Laird, J. E., Newell, A., (1987). Knowledge-level learning in Soar. *Proceedings of the National Conference on Artificial Intelligence*, Seattle, WA, 499-504.
79. Golding, A., Rosenbloom, P. S., Laird, J. E. (1987). Learning general search control from outside guidance. *Proceedings of the International Joint Conference on Artificial Intelligence*, Milano, Italy, 334-337.
80. Rosenbloom, P. S., Laird, J. E. (1986). Mapping explanation-based generalization onto Soar. *Proceedings of the National Conference on Artificial Intelligence*, Philadelphia, PA, 561-567.
81. Laird, J. E., Rosenbloom, P. S., Newell, A. (1984). Towards chunking as a general learning mechanism. *Proceedings of the National Conference on Artificial Intelligence*, Austin, TX, 188-192.
82. Laird, J. E., Newell, A. (1983). A universal weak method: Summary of results. *Proceedings of the International Joint Conference on Artificial Intelligence*, Kaufmann, Los Altos, CA, 771-773.

Less Rigorous Conferences

1. Laird, J. E., Derbinsky, N., Voigt, J. (2011). Performance Evaluation of Declarative Memory Systems in Soar, *Proceedings of BRIMS 2011*, Sundance, UT.
2. Laird, J. E. (2009). Towards Cognitive Robotics, *Proceedings of the SPIE Defense and Sensing Conferences*, Orlando, FL.
3. Marinier, R., Laird, J. E. (2006). A Theory of Comprehension and Appraisal, *Proceedings of the 18th European Meeting on Cybernetics and Systems Research, Symposium on Agent Construction and Emotions*.
4. Wray, R. E., Laird, J. E., Nuxoll, A., Jones, R. M. (2002). Intelligent Opponents for Virtual Reality Trainers, *Proceedings of the Interservice/Industry Training, Simulation & Education Conference*.
5. Enam-ur-Rehman, S., Ozair, M. Z., Laird, J. E. (2002). The Role of Confidence Factor in Humanizing the Decision Making of an AI Agent. *Proceedings of the International Multi-topic Conference, IEEE*.
6. Wallace, S., Laird, J. E. (2002). Toward Automatic Knowledge Validation. *Proceedings of the Eleventh Conference on Computer Generated Forces and Behavioral Representation*, 447-456.

7. Magerko, B., Laird, J. E. (2002). Toward Building an Interactive, Scenario-based Training Simulator. *Proceedings of the Eleventh Conference on Computer Generated Forces and Behavioral Representation*, 517-524.
8. Wallace, S., Laird, J. E., Coulter, K. (2000). Examining the Resource Requirements of Artificial Intelligence Architectures. *Proceedings of the Ninth Conference on Computer Generated Forces and Behavior Representation*.
9. Laird, J. E. (2000). An Exploration into Computer Games and Computer Generated Forces, *Proceedings of the Eighth Conference on Computer Generated Forces and Behavior Representation*.
10. Wallace, S. & Laird, J. E. (1999). Toward a Methodology for AI Architecture Evaluation: Comparing Soar, CLIPS. *Proceedings of the Conference on Agent Theories, Architectures, and Languages*. (reprinted as a chapter in *Intelligent Agents VI. Agent Theories Architectures, and Languages*, 2000).
11. Jones, R. M., Laird, J. E., & Nielsen P. E. (1998). Real-Time Intelligent Characters for a Non-Visual Simulation Environment. *Proceedings of the Computer Animation '98 Conference*.
12. van Lent, M., Laird, J. E. (1998). Learning by Observation in a Tactical Air Combat Domain, *Proceedings of the Seventh Conference on Computer Generated Forces and Behavioral Representation*. Orlando, FL.
13. Laird, J. E., Jones, R. M., Nielsen, P. E. (1998). Lessons learned from TacAir-Soar in STOW-97. *Proceedings of the Seventh Conference on Computer Generated Forces and Behavioral Representation*, Orlando, FL.
14. Jones, R. M., Neville, K, Laird, J. E. (1998). Modeling Pilot Fatigue with a Synthetic Behavior Model. *Proceedings of the Seventh Conference on Computer Generated Forces and Behavioral Representation*, 349-356, Orlando, FL.
15. Jones, R. M., Laird, J. E., Nielsen, P. E. (1996), Moving Intelligent Automated Forces into Theater-Level Scenarios, *Proceedings of the Sixth Conference on Computer Generated Forces and Behavioral Representation*, Orlando, FL.
16. Coulter, K. J., Laird, J. E. (1996). A Briefing-based Graphical Interface for Exercise Specification, *Proceedings of the Sixth Conference on Computer Generated Forces and Behavioral Representation*, Orlando, FL.
17. Jones, R. M., Laird, J. E., Nielsen, P. E. (1996). Moving Intelligent Automated Forces into Theater-Level Scenarios, *Proceedings of the Sixth Conference on Computer Generated Forces and Behavioral Representation*, Orlando, FL.
18. Laird, J. E., Johnson, W. L., Jones, R. M., Koss, F., Lehman, J. F., Nielsen, P. E., Rosenbloom, P. S., Rubinoff, R., Tambe, M., Van Dyke, J., van Lent, M., Wray, R. E. (1995). Simulated Intelligent Forces for Air: The Soar/IFOR Project 1995. *Proceedings of the Fifth Conference on Computer Generated Forces and Behavioral Representation*, Orlando, FL.
19. Laird, J. E. (1995). Intelligent Agents for Interactive Simulated Environments, *Proceedings of the Conference on Simulation in Virtual Environments*, University of Iowa.
20. Laird, J. E. (1994). Developing Humanlike AI Agents for Large Scale Simulation Environments, *Proceedings of the Lifelike Computer Characters Conference*, Snowbird, Utah.
21. Jones, R. M., Laird, J. E. (1994). Multiple Information Sources, Multiple Participants: Managing Situational Awareness in an Autonomous Agent. *Proceedings of the Fourth Conference on Computer Generated Forces and Behavioral Representation*. Orlando, FL.
22. Jones, R. M., Laird, J. E., Tambe, M., Rosenbloom, P. S. (1994). Generating Behavior in Response to Interacting Goals. *Proceedings of the Fourth Conference on Computer Generated Forces and Behavioral Representation*. Orlando, FL.

23. Laird, J. E., Jones, R. M., Nielsen, P. E. (1994) Coordinated Behavior of Computer Generated Forces in TacAir-Soar. *Proceedings of the Fourth Conference on Computer Generated Forces and Behavioral Representation*. Orlando, FL.
24. Rosenbloom, P. S., Johnson, W. L., Jones, R. M., Koss, F., Laird, J. E., Lehman, J. F., Rubinoff, R., Schwamb, K. B., Tambe, M., (1994). Intelligent Automated Agents for Tactical Air Simulation: A Progress Report. *Proceedings of the Fourth Conference on Computer Generated Forces, Behavioral Representation*. Orlando, FL.
25. Jones, R. M., Tambe, M., Laird, J. E., Rosenbloom, P. S. (1993). Intelligent Automated Agents for Flight Training Simulators, *Proceedings of the Third Conference on Computer Generated Forces*, Orlando, FL, 1993.
26. Laird, J. E. (1989). Learning from external environments using Soar, *Proceedings of the Applications of Artificial Intelligence VII*, SPIE, Orlando, CA, 575-576.
27. Unruh, A., Rosenbloom, P. S., Laird, J. E. (1987). Dynamic abstraction problem solving in Soar. *Proceedings of the AOG/AAAI 87 Joint Conference*, Dayton, OH, 245-256.

Symposia and Workshops with Printed Proceedings:

1. Mohan, S., Kirk, J., Mininger, A., and Laird, J. E. (2015) Agent Requirements for Effective and Efficient Task-Oriented Dialog, *AAAI Fall Symposium on Artificial Intelligence and Human Robot Interaction*, Washington, D.C.
2. Laird, J. E. (2013). Reflections on Abstractions for General Artificial Intelligence, *AAAI Fall Symposium on Abstractions for Intelligence*, Washington, D.C.
3. Laird, J. E. and Mohan, S. (2013). A Case Study of Knowledge Integration Across Multiple Memories in Soar, *AAAI Fall Symposium on Integrated Cognition*, Washington, D.C.
4. Mohan, S., Mininger, A., Kirk, J. and Laird, J. E. (2012). Learning Grounded Language through Situated Interactive Instruction, In *Papers from Robots Learning Interactively from Human Teachers* (AAAI Fall Symposium Series), November 2012, Washington D.C.
5. Mohan, S., and Laird, J. E. (2012). Situated Comprehension of Imperative Sentences in Embodied, Cognitive Agents, In the *AAAI 2012 Workshop on Grounding Language for Physical Systems*, Toronto CA
6. Laird, J. E., Kinkade, K. R., Mohan, S., and Xu, J. Z. (2012) Cognitive Robotics using the Soar Cognitive Architecture, *8th International Conference on Cognitive Robotics, (Cognitive Robotics Workshop, Twenty-Sixth Conference on Artificial Intelligence (AAAI-12))*, Toronto, CA.
7. Li, J., Laird, J. E. (2011) Preliminary Evaluation of Long-term Memories for Fulfilling Delayed Intentions. *Papers from the 2011 AAAI Fall Symposium Series: Advances in Cognitive Systems*. Arlington, VA.
8. Derbinsky, N., Laird, J. E. (2011) Effective and Efficient Management of Soar's Working Memory via Base-Level Activation. *Papers from the 2011 AAAI Fall Symposium Series: Advances in Cognitive Systems*. Arlington, VA.
9. Laird, J. E., Derbinsky, N. Tinkerhess, M. (2011) A Case Study in Integrating Probabilistic Decision Making and Learning in a Symbolic Cognitive Architecture: Soar Plays Dice. *Papers from the 2011 AAAI Fall Symposium Series: Advances in Cognitive Systems*. Arlington, VA.
10. Derbinsky, N., Laird, J. E.: *A Preliminary Functional Analysis of Memory in the Word Sense Disambiguation Task*. Proceedings of the 2nd Symposium on Human Memory for Artificial Agents, AISB, 25-29. York, England.
11. Mohan, S., Laird, J. E. (2011) Towards Situated, Interactive, Instructable Agents in a Cognitive Architecture, *Papers from the 2011 AAAI Fall Symposium Series: Advances in Cognitive Systems*. Arlington, VA.

12. Derbinsky, N., Laird, J.E. (2010). Extending Soar with Dissociated Symbolic Memories. *Symposium on Remembering Who We Are - Human Memory for Artificial Agents*, AISB.
13. Laird, J. E., Derbinsky, N. (2009). A Year of Episodic Memory, *IJCAI Workshop on Grand Challenges for Reasoning from Experiences*.
14. Gorski, N.A., Laird, J.E. (2006). Experiments in Transfer Across Multiple Learning Mechanisms. *Proceedings of the ICML-06 Workshop on Structural Knowledge Transfer for Machine Learning*. Pittsburgh, PA.
15. Marinier, R., Laird, J. E. (2006). A Theory of Comprehension and Appraisal, *18th European Meeting on Cybernetics and Systems Research, Symposium on Agent Construction and Emotion*.
16. Laird, J. E., Nuxoll, A., Stokes, D., Kerfoot, A., Wray, R.E. (2003). Creating Intelligent MOUT Adversaries within Unreal Tournament, *Symposium on Behavior Representation, the Commercial Gaming Industry: Current Opportunities, Future Prospects, Behavior Representation in Modeling and Simulation Conference*, Scottsdale, AZ.
17. Pearson, D. J., Laird, J. E. (2003). Example-drive Diagrammatic Tools for Rapid Knowledge Acquisition, *Workshop on Visualizing Information in Knowledge Engineering; 2nd International Conference on Knowledge Capture*, Sanibel, FL.
18. Magerko, B. & Laird, J. E. (2002). A Proposal for an Interactive Drama Architecture, *AAAI Spring Symposium on AI, Interactive Entertainment*, Palo Alto, CA.
19. Assanie, M. & Laird, J. E., (2002). Directable Synthetic Characters, *AAAI Spring Symposium on AI, Interactive Entertainment*, Palo Alto, CA.
20. Laird, J. E., E, Assanie, M., Benjamin Bachelor, Nathan Benninghoff, Syed Enam, Bradley Jones, Kerfoot, A., Colin Lauver, Magerko, B., Jeff Sheiman, Stokes, D., Scott Wallace. (2002). A Test Bed for Developing Intelligent Synthetic Characters, *AAAI Spring Symposium on AI, Interactive Entertainment*, Palo Alto, CA.
21. Konik, T., Laird, J. E. (2002). Hierarchical Procedural Knowledge Learning Through Observation using ILP, *The International Logic Programming Conference 2002 WIP session*.
22. Scott A. Wallace, Laird, J. E. (2002). Intelligence, Behavioral Boundaries, *Performance Metrics for Intelligent Systems Workshop*, Gaithersburg, MD.
23. Laird, J. E., Duchi, J. C. (2000). Creating Human-like Synthetic Characters with Multiple Skill Levels: A Case Study using the Soar Quakebot *AAAI 2000 Fall Symposium Series: Simulating Human Agents*: AAAI Technical Report FS-00-03.
24. Laird, J. E., Duchi, J. C. (2001). Creating Human-like Synthetic Characters with Multiple Skill Levels: A Case Study using the Soar Quakebot *AAAI 2001 Spring Symposium Series: Artificial Intelligence, Interactive Entertainment*: AAAI Technical Report SS-00-02. (This is the same paper as listed above – AAAI approved having it in both symposia.)
25. van Lent, M., Laird, J. E., (1998). Learning by Observation in a Complex Domain. *Workshop on Knowledge Acquisition, Modeling, Management*. Banff, Alberta, Canada,
26. Laird, J. E., Coulter, K.J., Jones, R. M., Kenny, P.G., Koss, F.V., Nielsen, P. E. (1998). Integrating Intelligent Computer Generated Forces in Distributed Simulation: TacAir-Soar in STOW 97. *1998 Simulation Interoperability Workshop*.
27. Laird, J. E., Pearson, D. J., Huffman, S. B. (1996). Knowledge-Directed Adaptation in Intelligent Agents. *AAAI Workshop on Intelligent Adaptive Agents*. Published in Imam, I.F., Kodratoff, Y., Intelligent Adaptive Agents: A Highlight on the Field, A Report on the AAAI-96 Workshop, A Technical Report of the Machine Learning, Inference Laboratory, George Mason University, 1996
28. Laird, J. E., Pearson, D. J., Jones, R. M., Wray, R. E. (1996). Dynamic Knowledge Integration During Plan Execution, in *AAAI Technical Report FS-96-01, Papers from the 1996 AAAI Fall Symposium on Plan Execution: Problems, Issues*, AAAI Press, Menlo Park, CA.

29. Tambe, M., Jones, R. M., Laird, J. E., Rosenbloom, P. S., Schwamb, K. (1994). Building Believable Agents for Simulation Environments: Extended Abstract, *AAAI Spring Symposium on Believable Agents*.
30. Jones, R. M., Wray, R. E., van Lent, M., Laird, J. E. (1994). Planning in the tactical air domain. *Planning, learning: On to real applications, papers from the 1994 AAI Fall symposium* (Technical Report No. FS-94-01). Menlo Park, CA: AAI Press.
31. Huffman, S. B., Laird, J. E., (1994). Acquiring procedures from tutorial instruction. *8th Banff Knowledge Acquisition for Knowledge-Based Systems Workshop*, (Eds.) B. Gaines, M. Musen.
32. Miller, C., Laird, J. E., (1991). A Constraint-Motivated Lexical Acquisition Model. *Eighth International Workshop on Machine Learning*, 95-99.
33. Laird, J. E. (1991). Characteristics of Tasks for Intelligent Agent Benchmarks. *In Collected Notes from The Benchmarks, Metrics Workshop*, Eds. M. E. Drummond, L. P. Kaelbling, S. J. Rosenschein, NASA Ames Technical Report FIA-91-06, 28-31, 1991.
34. Laird, J. E., (1990). Building Interactive Agents. *AAAI workshop on Interactive Fiction, Synthetic Reality*.
35. Laird, J. E. (1990). Interaction with External Environments using Soar. *Invited Panel, Cognitive Science Annual Conference*.
36. Laird, J. E. (1990). Integrating Planning, Execution in Soar for External Environments, *AAAI workshop on Planning in Uncertain, Unpredictable, Changing Environments*, Stanford, CA, 82-86.
37. Laird, J. E. (1989). Learning from external advice in Soar. *ONR workshop on Machine Learning*, Washington, D.C.
38. Laird, J. E. (1989). Interaction with the External World. *Symposium on Soar, Unified Theories of Cognition*, University of Groningen, The Netherlands.
39. Laird, J. E. (1989). Learning New Domain Theories. *DARPA Machine Learning Workshop*, Snowbird, Utah.
40. Laird, J. E., Rosenbloom, P. S. (1987), Research on Learning in Soar. *Second Annual Artificial Intelligence Research Forum, NASA Ames Research Center*, Palo Alto, CA.
41. D. Steier, Laird, J. E., Newell, A., Rosenbloom, P. S. (1987). Varieties of learning in Soar: 1987. *Fourth International Workshop on Machine Learning*, P. Langley (Editor), Kluwer, 300-311.
42. Laird, J. E., Rosenbloom, P. S., Newell, A. (1986). Overgeneralization during knowledge compilation in Soar. *Workshop on Knowledge Compilation*, Oregon State University, Otter Crest, OR, 46-57.
43. Rosenbloom, P. S., Laird, J. E., Newell, A., Golding, A., Unruh, (1985). A. Current research on learning in Soar. *1985 Machine Learning Workshop*, Skytop, PA, 163-172.

Book Chapters:

1. Marinier, R. and Laird, J. E. (2013), Computational Models of Emotion, In *Encyclopedia of the Mind*, Sage Publications.
2. Laird, J. E, van Lent, M. (2005). The Role of AI in Computer Game Genres, In *Handbook of Computer Game Studies*. 205-218.
3. Wallace, S. A., and Laird, J. E. (2000). Toward a Methodology for AI Architecture Evaluation: Comparing Soar and CLIPS. In *Intelligent Agents VI. Agent Theories Architectures, and Languages*, 117-131, Springer Berlin/Heidelberg.
4. Pearson, D. J., Laird, J. E. (1999). Toward Incremental Knowledge Correction for Agents in Complex Environments. In *Machine Intelligence 15*. Editors: Stephen Muggleton, Donald Michie, Koichi Furukawa, 185-204, Oxford University Press.

5. Lehman, J. F., Laird, J. E., Rosenbloom, P. S., (1998). A Gentle Introduction to Soar, an Architecture for Human Cognition, In *Invitation to Cognitive Science*, 4, Editors: S. Sternberg, D. Scarborough, MIT Press.
6. Laird, J. E., Rosenbloom, P. S. (1996). The Evolution of the Soar Cognitive Architecture. In *Mind Matters*. Eds. Steier, D., Mitchell, T., 1-50, LEA.
7. Huffman, S. B., Pearson, D., Laird, J. E. (1992). Correcting Imperfect Domain Theories: A Knowledge-Level Analysis. In *Foundations of Knowledge Acquisition: Cognitive Models of Complex Learning*, eds. Susan Chipman, Alan Meyrowitz, Kluwer Academic Press.
8. Laird, J. E. (1991). Soar, In *The Second Edition of the Encyclopedia of AI*, 1548-1550.
9. Rosenbloom, P. S., Laird, J. E., Newell, A. (1991). A Preliminary Analysis of the Foundations of Soar. In *Foundations of Artificial Intelligence*, D. Kirsch, D. Bobrow (Editors). (Also appeared in *Artificial Intelligence*.)
10. Laird, J. E., Hucka, M., Yager, E. S., Tuck, C. M. (1991). Robo-Soar: An integration of external interaction, planning, learning using Soar. In *Toward Learning Robots*, W. Van de Velde (Editor), MIT Press, Boston, MA.
11. Rosenbloom, P. S., Newell, A., Laird, J. E. (1991). Towards the knowledge level in Soar: The role of the architecture in the use of knowledge, In *Architectures for Intelligence*, VanLehn (Editor), Erlbaum, Hillsdale, NJ.
12. Newell, A., Yost, G. R., Laird, J. E., Rosenbloom, P. S., Altmann, E. (1991). Formulating the problem space computational model. In *Carnegie Mellon Computer Science: A 25 Year Commemorative*. R. F. Rashid (Editor), ACM Press/Addison-Wesley, 255-293.
13. Newell, A., Rosenbloom, P. S., Laird, J. E. (1989). Symbolic architectures for cognition, In *Foundations of Cognitive Science*, (Editor) M.I. Posner, Bradford Books, 93-132, Cambridge, MA.
14. Rosenbloom, P. S., Laird, J. E., Newell, A. (1988). The chunking of skill, knowledge. In *Working Models of Human Perception*, Academic Press, London, 391-410, 1988.
15. Rosenbloom, P. S., Laird, J. E., Newell, A. (1988). Meta-levels in Soar. In *Meta-level Architectures, Reflection*, (Eds.) Maes, Nardi, North Holland, 227-240.

Letters, briefs, videos, posters, demonstrations, notes or other shorter communications

1. Laird, J. E. (2012). The Soar Cognitive Architecture, *AISB Quarterly*, #134.
2. Nuxoll, A., Laird, J. E., James, M. (2004). Comprehensive Working Memory Activation in Soar. Poster, *International Conference on Cognitive Modeling*.
3. Forbus, K., Laird, J. E. (2002). Guest Editors' Introduction: AI, the Entertainment Industry, *IEEE Intelligent Systems*, 17(4), 15-16.
4. Laird, J. E. (2000). Bridging the gap between computer game developers, artificial intelligence researchers, *Game Developer Magazine*, 34.
5. van Lent, Laird, J. E., Buckman, J., Hartford, J., Houchard, S., Steinkraus, K., and Tedrake, R. (1999). Intelligent Agents in Computer Games, Demonstration, abstract, *National Conference on Artificial Intelligence*, Orlando, FL, pp. 929-930.
6. Huffman, S. B., Laird, J. E. (1993). Instructo-Soar: Learning from interactive natural language instructions, *National Conference on Artificial Intelligence*, Videotape, abstract.
7. Pearson, D. J., Jones, R. M., Laird, J. E. (1993). Air-Soar: Intelligent multi-level control. Videotape, abstract, *National Conference on Artificial Intelligence*.
8. Laird, J. E., Rosenbloom, P. S., (1991). A Review of the AAAI Spring Symposium on Integrated Intelligent Architectures. In *AI Magazine*, 12(4), 35-36.
9. Laird, J. E., Hucka, M., Huffman, S. B., Rosenbloom, P. S. (1991). An Analysis of Soar as an Integrated Architecture, in *SIGART Bulletin*, 2(4), 98-103, ACM Press.

10. Laird, J. E., (1991). Preface, Editor of Integrated Cognitive Architectures, SIGART Bulletin, 2 (4), 12-184, ACM Press.
11. Fayyad, U., Laird, J. E., Irani, K. (1989). A Review of the Fifth International Conference on Machine Learning, In *AI Magazine*, 10(2), 79-84.

MAJOR INVITED PRESENTATIONS

- Invited Plenary Speaker, “The Cognitive Architecture Approach to General Artificial Intelligence,” The Joint Multi-Conference on Human-Level Artificial Intelligence, New School, New York City, July 2016.
- Invited Plenary Speaker, “Reflections on Cognitive Architecture and Interactive Task Learning,” Cognition for Human Performance and Autonomous Systems Workshop, Dayton, OH, May 2016.
- Invited Speaker, “The Role of Cognitive Architecture and Interactive Task Learning in General AI,” The Future of AI Symposium, NYU, Jan. 2016.
- Invited Speaker, “Cognitive Architecture,” Designing Minds Workshop, Northwestern University, Sept. 2014.
- Invited Speaker, “The Cognitive Architecture Approach to Intelligent and Autonomous Systems,” Karles International Conference on Intelligent Autonomous Systems Science and Technology,” Washington, D. C., Jan. 2014.
- Keynote Speaker, “Challenges and Approaches to Integrated Cognition in Soar.” AAAI Fall Symposium on Integrated Cognition, Nov. 2013.
- Invited Speaker, “Building a General Instructable Agent using the Soar Cognitive Architecture.” University of Michigan-Dearborn Computer Science Distinguish Lecture Series, Oct. 2013.
- Keynote Speaker, Sciences of Autonomy Workshop, ONR, July 2012.
- Keynote Speaker, “TacAir-Soar: The Next Generation,” Behavior Representation in Modeling and Simulation, Sundance, UT, March 2011.
- Keynote Speaker, “Intelligent Autonomy for Unmanned Vehicles,” Joint Unmanned Air Systems, Center of Excellence, Advisory Council Meeting, Tampa, FL, December 2010.
- Keynote Speaker, “The Role of Production Rules in a General Cognitive Architecture,” Rules Fest 2010, San Jose, CA, October 2010.
- Keynote Speaker, “Cognitive Architecture,” Decade of the Mind Conference, Jan. 2009.
- Invited Speaker, “Integrating Mental Imagery in Cognitive Architecture,” ARFL Workshop on Modeling Spatial Cognition, May 2009.
- Keynote Speaker, “The Future of Cognitive Architecture,” ACT-R Workshop, Carnegie Mellon University, June 2008.
- Invited Speaker, “The Future of Cognitive Architecture,” EECS Distinguished Seminar, Northwestern University, April 2008.
- Keynote Speaker, “Is Cognitive Science the Right Method for AI,” Cognitive Science Conference, 2007.
- Invited Speaker, “The TOSCA Cognitive Architecture,” The Eleventh International Conference on Cognitive and Neural Systems, May 2007, Boston University.
- Invited Plenary Speaker, “The Importance of Architecture for Achieving Human-level AI,” DARPA/IPTO Conference on Cognitive Systems, Washington D.C., May 2005.
- Keynote Speaker, “Cognitive Architecture and Architectures for Cognitive Systems,” Workshop on Research Directions in Architectures and Systems for Cognitive Processing, Cornell University, August 2005.

- Keynote Speaker, “Episodic Memory vs. Case-based Reasoning,” Workshop on Case-based Reasoning in Computer Games, DePaul University, August 2005.
- Invited Speaker, “Building Complex Human-level Synthetic Characters,” EA Distinguished Speaker Series, EA Canada, Vancouver, CA, January 2005.
- Invited Speaker, “Building Complex Human-Level Synthetic Characters”, Research Triangle Distinguished Lecture Series in Computer Science, April 26, 2004.
- Invited Plenary Speaker, “Artificial Intelligence and Character Development,” Game Technology Conference, Toronto, Canada, April 9, 2004.
- Invited Speaker, “Future Directions of AI in Interactive Entertainment,” Imagina, Monte Carlo, Monaco, February 2, 2004.
- Invited Speaker, “Computer Games,” Distinguished Lecture Series Distinguished Lecture in Cognitive Science, Rensselaer Polytechnic Institute, April 25, 2003.
- Invited Plenary Speaker, “Learning by Imitation for Human-level Knowledge-based Systems”, Second International Symposium on Imitation in Animals and Artifacts, AISB April 7, 2003.
- Invited Plenary Speaker, IBM EDGE Conference. “Artificial Intelligence for Computer Games: Beyond Bots”, April 9-10, 2002.
- Invited Speaker, “Developing Intelligent Synthetic Characters for Computer Games and Military Training”, Naval Research Laboratory AI Distinguished Speaker Series, November 2001.
- Invited Speaker, “The Turing Test, Computer Generated Forces, Interactive Computer Games, and Unified Theories of Cognition” IBM, Conference on the Turing Test, February 2001.
- Invited Plenary Speaker, “Interactive Computer Games: Human-level AI's Killer Application,” National Conference on Artificial Intelligence, AAAI, August 2000.
- Invited Speaker, “Toward Human-level AI for Computer Games”, Distinguished Lecture Series, Middlesex University, England, June 2000.
- Invited Speaker, Distinguished Lecture Series in Cognitive Science, A series of three lectures over three days, Stanford University, 1999.
- Invited Plenary Speaker, “Toward Human-like AI.” Florida Artificial Intelligence Research Symposium, May 3-6, 1999.
- Invited Plenary Speaker, “Ascent of Soar,” National Conference on Artificial Intelligence, July 27-31, 1997.
- Invited Keynote Speaker, Applications of Artificial Intelligence Conference, 1989.
- Invited Keynote Speaker, Third Conference on Artificial Intelligence Applications, 1987.
- Invited Keynote Speaker, Space Operations, Automation and Robotics 1987.

NATIONAL AND INTERNATIONAL SERVICE

Conference and Workshop Organization

- Co-Chair, Ernst Strungmann Forum on Interactive Task Learning, 2017
- Workshop Chair and Organizer, NSF workshop on Interactive Task Learning, 2014
- Program Co-Chair, Conference on Advances in Cognitive Systems, 2013
- Organizing Committee, Conference on Advances in Cognitive Systems, 2012, 2013, 2015-2017
- Organizing Committee, Fourth International Conference on Artificial General Intelligence, 2011
- Organizing Committee, Behavior Representations in Modeling and Simulation, 2011
- Organizer, Workshop on Evaluation of Human-Level Intelligence, Sponsored by ONR, 2008, Ann Arbor, MI
- Oversight Committee for the Foundations of Digital Games Conference, 2009-2010.
- General Chair, International Conference on Cognitive Modeling, July 2007, Ann Arbor, MI
- General Chair, Second Conference on Artificial Intelligence and Interactive Digital Entertainment (AIIDE), June 2006, Los Angeles, CA
- Program Chair, First Conference on Artificial Intelligence and Interactive Digital Entertainment (AIIDE), June 2005, Los Angeles, CA
- Co-Chair, InCog Symposium, March 2003, Stanford, CA
- Co-Chair AAI Spring Symposium for AI and Interactive Entertainment, 2001
- Area Chair, National Conference on Artificial Intelligence 1994
- Video Chair, National Conference on Artificial Intelligence 1994
- Chair, AAI Spring Symposium on Integrated Intelligent Architectures, 1991
- Area Chair, IJCAI 1991
- Member, Local Arrangements Committee for IJCAI-89
- General Chair, Fifth International Conference on Machine Learning, 1988
- Organizer/Chair of the Soar workshops, 1987, 1989, 1992, 1994, 1997, 1999, 2001-2016, Ann Arbor, MI.

Program Committees

- National Conference on Artificial Intelligence, 1987, 1988, 1993, 1997, 2010-2016
- Foundations of Digital Games, 2009
- Virtual Humans Workshop, 2006
- Game Technology Conference, 2003
- Computer Game Conference and workshop, July 2002, Alberta
- 11th Conference on Computer Generated Forces and Behavior Representation, 2002
- AAI Spring Symposium for AI and Interactive Entertainment, 1999, 2000, 2001, 2002
- International Machine Learning Conference, 1990, 1991, 1993

Invited DOD workshops and studies to set research priorities (does not include yearly program reviews)

- Presenter, Jason's Committee: Perspectives on Research in Artificial Intelligence and Artificial General Intelligence Relevant to DoD, 2016
- Member, ONR Scientific Advisory Committee on Machine Reasoning, 2010
- ONR Workshop on Machine Reasoning, November 2009
- DARPA Workshop on Complete Intelligence, February 2009
- ONR Workshop on Synthetic Environments for Assessment, January 2009
- DARPA Workshop on Deep Learning, September 2008
- DARPA Workshop on Learning Generalized Task Models, August 2004
- DARPA Workshop on AI Big Problems, March 2004

- DARPA Workshop on Information and Decision Analysis System Engineering Workshop, Stanford, March 3-4, 2004
- DARPA Workshop on Cognitive Systems Metrics and Benchmarks, May 6, 2004
- DARPA Workshop on Cognitive Systems and Visibly Controllable Computing, Washington, D.C., Jan. 2003
- DARPA Workshop on Cognitive Systems, November 4, 2002
- DARPA ISAT Study on Massively Multi-Player Games, 2002
- Defense Modeling and Simulation Office Expert Panel on Human Behavior Representation, 2002
- DARPA ISAT Summer Study on Agents, 1996
- DARPA ISAT Summer Study on Autonomous Agents, 1991

Editorial activities:

- Advisory Board, Journal of Game Development, 2003-2007
- Editor, Special Issue of IEEE Intelligent Systems on Interactive Entertainment, 2002
- Editorial Board of Journal of Artificial Intelligence Research (JAIR), 1996-1999

Other

- Cognitive Science Society *Robert J. Glushko Dissertation Prize in Cognitive Science Award Committee*, 2015-2017
- ACM/AAAI Newell Award Committee, 2011-2017, Chair 2016-2017.
- NSF CISE review panel, 2016, 2017
- NSF CAREER review panel, 2014
- Doctorial Consortium, International Conference on Cognitive Modeling, 2010.
- Officer: Society for the Advancement of the Science of Digital Games, 2008-2010.
- Blue-ribbon Review Panel for Computer Science Program at Virginia Commonwealth University, January 2002.
- Final Panel on CISE Research Infrastructure Program, April 1997.

INTERNAL SERVICE

University of Michigan:

- Director of the Center for Cognitive Architecture (2006-2012)
- Provost Search Committee (2005)
- Chair, School of Information Internal Review Committee (2004)
- Faculty advisor to Women's Club Volleyball team (2003-2004)
- Faculty advisor to WolverineSoft: Student computer game development club (2002-2012)
- UM Digital Strategy Council (2002-2005)
- Provost Seminars on Teaching (PSOT) Planning Group (2002-2003)
- ADVANCE Implementation Committee (oversee NSF grant, 2002-2004)
- Provost Faculty Advisory Committee (2001-2004)
- CITI Advisory Board (2001-2003)
- Rackham Interdisciplinary Grant Review Panel (2001-2003)
- President's Information Revolution Commission, Co-Chair of research subcommission, (2000-2001)
- President's Information Revolution Commission, member of the teaching subcommission (2000-2001)
- School of Information Dean Search (Fall 1998-Summer 1999)
- Co-coordinator: Rackham Interdisciplinary Summer School (Summer 1998)

- UM VCM Oversight Committee (1995-2000)
- Cognitive Science and Cognitive Neuroscience Executive Committee (1994-1998)
- UM Committee to study Cognitive Science (1992-1993)
- CSMIL Executive Committee (1986-1987)

College of Engineering:

- COE Research Advisory Committee (2012-2013)
- COE Executive Committee (2008-2011)
- COE Department Chair Committee (2001-2004)
- Faculty oversight for Visual Special Effects Lecture Series (2001)
- Task Force on Technology Transfer and Commercialization (1998)
- College Graduate Committee (1996-1999)

EECS Department:

- Chair of CSE Visioning Committee (2016)
- CSE Executive Committee (2015-)
- Chair of CSE Graduate Committee (2014-)
- CSE Executive Committee (2012-2013)
- CSE Internal Review Committee (2012)
- Interim Chair of CSE (Spring 2011)
- CSE Graduate Committee (2007-2008)
- CSE@50 Organizing Committee (2007-2008)
- Director of the Artificial Intelligence Laboratory (2005-2006)
- EECS Strategic Planning Subcommittee on Department Structure and Faculty Environment (2005)
- CSE Scholars Program Principle Investigator (2004-2008)
- Associate Chair of EECS, CSE Division (2000-2004)
- EECS Administration Committee (2000-2004)
- Chair CSE Search Committee (2000-2004)
- EECS Awards Committee (2000-2004)
- EECS Executive Committee (2000-2004)
- CSE Building Steering and Executive Committees (2000-2008)
- EECS Future Committee (2000-2001)
- Organizer of the Computer Games Distinguished Lecture Series (2000-2004)
- EECS Search Committee for Department Chair (1996-1997)
- Chair, CSE Graduate Affairs Committee (1996-1999)
- EECS Departmental Review Committee (1996)
- EECS Executive Committee (1994-1996)
- CSE Search Committee (1994-1995)
- EECS Ad hoc Committee on Graduate Education (1994)
- Director of the Artificial Intelligence Laboratory (1993-1999)
- CS Advisory Committee (1991-1993)
- Chair, CSE Ad-Hoc Committee on Undergraduate Education (1991)
- CSE Ad-Hoc Committee on Candidacy (1991)
- EECS Search Committee for Department Chair (1990)
- CSE Graduate Committee (1989-1990)
- Director of AI Lab (1989)

- CSE Ad-Hoc Committee on Research Directions in CSE (1989)
- CSE Ad-Hoc Committee on Qualifying Exams (1989)

GRANTS, CONTRACTS, AND GIFTS

- PI, Using Mental Models in Human Robot Interaction, Intel Corp, \$80,000, Dec 2016-Dec 2017.
- PI, Interactive Task Learning, AFOSR, \$514,451, April 2015-April 2018.
- PI, Integration and Interactions Among Cognitive Architecture Learning Modules, ONR, \$764,294, Jan 2015-Jan 2018.
- PI, NSF EAGER: Enabling Taskability: Research on Teaching Computers New Tasks, NSF, \$300,000, April 2014-May 2016.
- PI, Workshop on Taskability, NSF, \$13,500, March 2014-February 2015.
- Co-PI (with Edwin Olson), Cognitive Architecture Approaches to Continuous Action Model Learning and Long-term Goal Management, ONR, \$2,000,000, February 2013-January 2018.
- PI, SCALE, Soar Technology Prime, DARPA/BOLT-E, \$420,000, 2011-2012.
- PI, Support of Virtual Human Development Using Soar, USC subcontract, \$50,000, January 2010-October 2010.
- PI, Extending Semantic and Episodic Memory to Support Robust Decision Making, AFOSR, \$502,000. July 2010-June 2013.
- Co-PI, Building Flexible, Robust, and Autonomous Agents, NSF, \$1,100,000 (1 of 4 UM faculty). July 2009-June 2013.
- PI, Workshop on Evaluation of Human-Level AI, ONR, \$10,000. July 2008.
- PI, Research on Computer Game Engines, Microsoft (gift), \$11,000. June 2008.
- PI, Integration and Interactions among Cognitive Architecture Learning Modules, ONR. \$2,000,000, January 2008-January 2017 (twice renewed).
- Co-PI, Ground Robotics Reliability Center, TARDEC, \$1,100,000 (my portion). July 2007- June 2010.
- PI, Funding in Support of the International Conference on Cognitive Modeling, ONR, AFOSR, NSF, \$42,000. Oct. 2006.
- PI, Extending the Soar Cognitive Architecture, DARPA, \$1,106,000. September 2005-June 2007.
- PI, Research on Transfer Learning in Soar, Subcontract from ISLE, originally from DARPA, \$758,000. October 2005-September 2008.
- PI, Integrating Soar with TIELT, DARPA-NRL, \$100,000. September 2004-August 2005
- PI, Research in Architectural Approaches to the Integration of Empirical, Analytic and Episodic Learning, \$480,000. DARPA-AFRL, September 2004-Dec. 2005.
- PI, Integrating Reinforcement and Episodic Learning in a General Cognitive Architecture, NSF, \$435,000. June 2004-May 2007.
- PI, CSE Scholars Program, NSF, \$400,000. July 2004 to June 2008.
- PI, Research in Architectural Approaches to the Integration of Empirical, Analytic, and Episodic Learning within Soar, DARPA, \$300,000. September 2003-December 2004.
- PI, Gift from Microsoft for using computer game technology in support of computer science education. \$30,0000. 2003.
- PI, Gift from SAIC to support research in human level synthetic characters, \$25,000. 2003.
- Co-PI, An Infrastructure for Wide Area Pervasive Computing, NSF, \$550,000, September 2003-August 2006. I had only a minor role in this proposal.
- PI, Towards Human-like Adversaries for MOUT Training, Office of Naval Research, \$365,000, Dec. 2001-Sept. 2003.
- PI, Dynamic Modeling using Computer Game Technology, subcontract from Veridian, \$80,000, August 2000-August 2001.

- Generic Interfaces to AI Architectures, Institute for Creative Technology/Defense Modeling and Simulation Office, \$50,000, September 2002-June 2003.
- PI, Interactive Diagrammatic Knowledge Management Tools for Human Behavior Models, Office of Naval Research, \$350,000, January 2003-December 2005.
- PI, Development of a Pedagogical Computer Game Library, NSF, \$75,000, Jan 2003-Dec. 2004.
- PI, Natural Agents for Autonomous Adaptation to Threats, DARPA, \$50,000, 2002-2003.
- PI, Integrating Direction in Believable Synthetic Characters, subcontract from Institute for Creative Technology, University of Southern California, \$150,000, March 2001-November 2004.
- PI, Intelligent Synthetic Characters for Computer Games, Dell Computer Corporation \$30,000. 1999-2000.
- PI, Research on Autonomous Synthetic Entities, Office of Naval Research, \$923,699 August 1999-July 2002.
- PI, Cognitive Modeling of Skill Levels, Office of Naval Research, \$280,000 Jan. 1998-Oct. 2000.
- PI, Research and Development of Fatigue Models in TacAir-Soar. Subcontract from Systems Research Laboratories, Air Force Contract F41624-95-D-6026, \$43,037, July 1,1997-December 31, 1998.
- PI, Modeling Airman Cognitive Performance Using Soar-ModSAF Architecture. Subcontract from Sytronics Inc. from DARPA. \$15,000, July 1, 1997-Sept. 30,1997.
- PI, Intelligence Reconnaissance Synthetic Theater of War. Subcontract from Sytronics Inc. from DARPA. \$35,000, July 1, 1997-December 31, 1997.
- PI, Research on Advanced Intelligent Synthetic Forces, DARPA/ITO via STRICOM. \$2,288,000, May 1997-Oct. 1999.
- PI, Intelligent Forces for Simulated Environments (Air Force Entities). Subcontract with University of Southern California (which is contracted with NRaD, ARPA/ITO), \$90,975, October 1996-October 1997.
- PI, Intelligent Forces for Air and Navy Command in Simulated Environments, Subcontract from University of Southern California (which was contracted with NRaD, ARPA/ASTO). ~ \$2,500,000, Feb. 1995-Feb. 1998.
- PI, Research on Soar, gift from Carnegie Mellon University, \$60,000.
- PI, Intelligent Automated Agents and Analysis Tools for Simulated Environments, ARPA/ASTO. ~ \$4,000,000, July 92-June 95, Approx. 65% subcontracted to USC/ISI and Carnegie Mellon University.
- PI, Fusion of Robotics, Artificial Intelligence, Perception and Human Systems for Advanced Space Missions. NASA Ames and ONR \$550,000 for Oct. 1990-Sept. 1993.
- J. Laird and S. Huffman, Rackham Research Partnership Program. Funded Scott Huffman's research for 1991-1992: approx. \$13,200.
- IPoCSE grant from Nissan for \$20,000 to support research in Cognitive Systems.
- Co-PI with Ramesh Jain, Edmund Durfee, Michael Walker, and Terry Weymouth. A Proposal for IBM/UM Distributed Computing Initiative: Research on Distributed Artificial Intelligence. Awarded three RS/6000 workstations.
- Co-PI with Ramesh Jain, Edmund Durfee, Michael Walker, and Terry Weymouth. Engineering Research Equipment Grant for Real-Time Computer Vision and Robotics Integration. Total grant is \$73,710. This is an equipment grant that is shared

between the PIs.

- Soar VI Workshop, from AAAI, for \$5,000.
- PI, Fifth International Conference on Machine Learning, from AAAI, for \$5,000.
- PI, Fifth International Conference on Machine Learning, from ONR, for \$7,000.
- PI, Integrating Learning of Perception, Cognition, and Motor Control in Soar, with Office of Naval Research, September 1988-August 1990 for \$150,000.
- Co-PI on a grant from the Presidential Initiatives Fund of the University of Michigan with Susan Gelman, Steve Lytinen, and William Croft. A Cognitive Science Model of Language Acquisition, September 1988-August 1991, \$291,949.
- PI on a contract from NASA Ames: Fusion of Robotics, Artificial Intelligence, Perception and Human Systems for Advanced Space Missions. November 1988-October 1990 for \$400,000.
- Co-PI on a contract from NASA Ames with Lynn Conway and Richard Volz: Fusion of Robotics, Artificial Intelligence, Perception, and Human Systems for Advanced Space Missions. November 1987-October 1988. \$135,000 for my research activities.
- PI of contract from Carnegie Mellon University to Xerox PARC. Research on Soar as an Architecture for General Intelligence. October 1985-September 1986 for \$202,265.00. (Subcontract of a DARPA contract.)

TEACHING

Courses Taught

Included are student responses to end of term surveys. The two questions listed are:

Q1: Overall, this was an excellent course

Q2: Overall, the instructor was an excellent teacher

The responses are averages across all students who responded based on the following scale:

1 strongly disagree, 2 disagree, 3 neutral, 4 agree, 5 strongly agree

* indicates the first time that a newly developed course was taught. I have developed a total of eight new courses at Michigan.

- Fall 2016 AI Foundations, EECS 592: 37/68 students, Q1: 3.75, Q2: 4.04
- Winter 2016 Professionalism, EECS 496: 67/240 students, Q1: 4.07, Q2: 4.70
- Fall 2015 Professionalism, EECS 496: 67/201 students, Q1: 4.50, Q2: 4.87
- Fall 2014 Professionalism, EECS 496: 59/212 students, Q1: 3.86, Q2: 4.52
- Winter 2013 Cognitive Architecture, EECS 598: 7/13 students, Q1: 4.63, Q2: 4.63
- Fall 2012 Computer Games Development, EECS 494: 10/46 students, Q1: 4.17, Q2: 4.67
- Fall 2011 Computer Games Development, EECS 494: 8/45 students, Q1: 4.83, Q2: 4.83
- Winter 2011 Professionalism, EECS 496: 33/117 students, Q1: 3.83, Q2: 4.34
- Fall 2010 Computer Games Development, EECS 494: 8/45 students, Q1: 4.39, Q2: 4.35
- Winter 2010 Professionalism, EECS 496: 48/129 students, Q1: 4.23, Q2: 4.7
- Fall 2009 Computer Games Development, EECS 494: 41 students, Q1: 4.30, Q2: 4.5
- Winter 2009 Advanced AI, EECS 592: 14 students, Q1: 4.75, Q2: 4.75
- Fall 2008 Computer Games Development, EECS 494: 28 students, Q1: 4.94, Q2: 4.86
- Winter 2008 Advanced AI Techniques, EECS 792: 10 students, Q1: 4.67, Q2: 4.67
- Fall 2007 Computer Games Development, EECS 494: 38 students, Q1: 4.56, Q2: 4.56
- Winter 2006 Advanced AI Techniques, EECS 792: 14 students, Q1: 4.13, Q2: 4.36
- Fall 2005 Computer Games Development, EECS 494: 38 students, Q1: 4.55, Q2: 4.55
- *Winter 2005 Advanced AI Techniques, EECS 598: 18 students, Q1: 3.81, Q2: 4.65
- Fall 2004 Computer Games Development, EECS 494: 60 students, Q1: 4.42, Q2: 4.63
- Fall 2003 Computer Games Development, EECS 494: 47 students, Q1: 4.75, Q2: 4.84
- *Winter 2003 AI & Computer Games, EECS 498: 40 students, Q1: 4.32, Q2: 4.36
- Fall 2002 Computer Games Development, EECS 494: 50 students, Q1: 4.86, Q2: 4.83
- *Winter 2002 Digital Foundry, EECS 498: 20 students, No evaluations
- Fall 2001 Computer Games Development, EECS 494: 50 students, Q1: 4.81, Q2: 4.81
- Fall 2000: Computer Games Development, EECS 494: 45 students, Q1: 4.77, Q2: 4.70
- Winter 1999, Data Structures, EECS 380: 85 students, Q1: 3.98, Q2: 4.05
- Fall 1998: Computer Games Development, EECS 494: 57 students, Q1: 4.91, Q2: 4.78
- Winter 1998: Machine Learning, EECS 545: 13 students, Q1: 4.40, Q2: 4.60
- Fall 1997: Computer Games Development, EECS 494: 40 students, Q1: 4.21, Q2: 4.12
- *Fall 1996: Computer Games Development, EECS 498: 40 students, Q1: 4.88, Q2: 4.83
- Winter 1996: Data Structures, EECS 380: 50 students, Q1: 3.95, Q2: 4.22
- *Fall 1995: Symbolic Cognitive Modeling, EECS 596: 20 students, Q1: 4.30, Q2: 4.20
- Winter 1995: Introduction to AI, EECS 492: 65 students, Q1: 3.75, Q2: 3.83
- Fall 1994: Advanced AI, EECS 592: 8 students, Q1: 4.10, Q2: 4.50
- Winter 1994: Cognitive Architecture, EECS 547: 21 students, Q1: 4.29, Q2: 4.23
- Winter 1992: Advanced AI, EECS 592: 16 students, Q1: 4.50, Q2: 4.61
- Fall 1991: Foundations of AI, EECS 492: 45 students, Q1: 4.40, Q2: 4.39

- Winter 1991: Cognitive Architecture, EECS 547: 24 students, Q1: 4.38, Q2: 4.55
- Fall 1990: Foundations of AI, EECS 492: 48 students, Q1: 4.13, Q2: 4.18
- Winter 1990: Machine Learning, EECS 545: 39 students, Q1: 4.18, Q2: 4.46
- Fall 1989: Foundations of AI, EECS 492: 45 students, Q1: 4.39, Q2: 4.30
- Winter 1989: Cognitive Architecture, EECS 547: 27 students, Q1: 4.32, Q2: 4.50
- Fall 1988: Foundations of AI, EECS 492: 68 students, Q1: 4.39, Q2: 4.16
- *Winter 1988: Cognitive Science, University 325: 25 students, No evaluations
- Fall 1987: Foundations of AI, EECS 492: 73 students, Q1: 3.93 Q2: 3.68
- *Winter 1987: Machine Learning, EECS 598 (545): 21 students, Q1: 4.40, Q2: 4.25
- *Fall 1986: Cognitive Architecture, EECS 598 (547): 24 students, Q1: 3.63, Q2: 3.5

**New courses developed:*

Developed eight new classes, three of which were interdisciplinary (taught with faculty from other colleges than CoE).

- Advanced AI Techniques, EECS 598, became EECS 792, Enrollment 17 first time offered (Winter 2005), 14 the second time (Winter 2006). This course was established to replace the Intelligent Systems Written Qualifying Examination. I subsequently merged this course with EECS 592 (which is now EECS 692).
- AI and Computer Games, EECS 498, Winter 2003, Enrollment 40. The course allowed the students to study the AI techniques used in commercial computer games while also exploring more advanced AI techniques and allowing them to test them empirically in a real game context.
- Digital Foundry, EECS 498, Winter 2002, Enrollment 20. Co-taught with Andrew Kirschner and Elliot Soloway. Integration of digital media, art and music. An interdisciplinary course for undergraduates from CoE, Music, and Art.
- Computer Games Development, EECS 494. Originally taught as a 498-2 course in Fall 1996. Taught yearly since then. Enrollments average 40-60.
- Symbolic Cognitive Modeling, EECS 598/Psych. 880. It has become a regular psych. course. Taught in Fall 1995, Enrollment: 20. Offered Winter, 1997 and every year since then by Thad Polk, Psychology Department.
- Cognitive Science, University 325. Eight faculty from three colleges worked to create this course. It was first offered in Win.1988, which Laird taught with William Croft from Linguistics. It was offered every winter for approximately 5 years. Enrollment 25.
- Machine Learning, EECS 545. Originally taught as a 598 course in Winter 1987. Taught again in Winter 1990. Now taught every year, although it has been completely redesigned in recent years.
- Cognitive Architecture, EECS 547. Originally taught as a 598 course in Fall 1986. Taught a total of four times through Winter 1994.

Ph.D. Committees Chaired at The University of Michigan

1. Shaul Markovitch, 1989, co-chair with Paul Scott
2. John Paxton, 1990, co-chair with Paul Scott
3. Mark Wiesmeyer, 1991, chair
4. Arie Covrigaru, 1992, chair
5. Eric Yager, 1992, chair
6. Craig Miller, 1993, chair
7. Scott Huffman, 1993, chair
8. Clare Congdon, 1995, co-chair with John Holland
9. Doug Pearson, 1996, chair

10. Seth Rogers, 1997, co-chair with Paul Nielsen
11. Robert Wray III, 1998, chair
12. Ron Chong, 1998, chair
13. Michael van Lent, 2000, chair
14. Joe Phillips, 2000, chair
15. Scott Wallace, 2003, chair
16. Brian Magerko, 2006, chair
17. Tolga Konik, 2007, chair
18. Andrew Nuxoll, 2007, chair
19. Scott Lathrop, 2008, chair
20. Robert Marinier, 2008, co-chair with Rick Lewis
21. Sam Wintermute, 2010, chair
22. Yongjia Wang, 2010, chair
23. Nick Gorski, 2011, chair
24. Nate Derbinsky, 2012, chair
25. Joseph Xu, 2013, chair
26. Shiwali Mohan, 2014, chair
27. Justin Li, 2015, chair

Tutorials

- Soar Tutorial, 25 attendees, International Joint Conference on Artificial Intelligence 2016, New York, NY. July 2016.
- Soar Tutorial, 20 attendees, 36th Soar Workshop, Ann Arbor, MI. June 2016.
- Soar Tutorial, 20 attendees, 35th Soar Workshop, Ann Arbor, MI. June 2015.
- Soar Tutorial, 20 attendees, 34th Soar Workshop, Ann Arbor, MI. June 2014.
- Soar Tutorial, 40 attendees, International Conference on Cognitive Modeling, Ottawa, CA. July 2013.
- Soar Tutorial, 20 attendees, 33rd Soar Workshop, Ann Arbor, MI. June 2013.
- Soar Tutorial, 15 attendees, 32nd Soar Workshop, Ann Arbor, MI. June 2012.
- Soar Tutorial, 15 attendees, 31st Soar Workshop, Ann Arbor, MI. May 13-14, 2011.
- Soar Tutorial, 10 attendees, ONR Meeting, Ann Arbor, MI. June, 2011.
- Soar Tutorial, 12 attendees, 29th Soar Workshop, Ann Arbor, MI June 22-23, 2009.
- Soar Tutorial, 60 attendees, AGI Conference, March 1, 2009, Washington, D. C.
- Soar Tutorial, 10 attendees, 28th Soar workshop, Ann Arbor, MI. May, 2008.
- Soar Tutorial, 7 attendees, May 21-23, 2007, 27th Soar Workshop, Ann Arbor, MI.
- Soar Tutorial, 24 attendees, May 22-24, 2006, 26th Soar Workshop, Ann Arbor, MI.
- Soar Tutorial, 25 attendees, July 9, 2005, AAAI, Pittsburgh, PA,
- Soar Tutorial, 15 attendees, June 13-14, 2005, 25th Soar Workshop, Ann Arbor, MI.
- AI Learning Techniques for Games, 200 attendees, March 2005, GDC, San Francisco, CA, with Michael van Lent.
- DXFramework, 20 attendees, Feb. 24-25, 2005, SIGCSE, St. Louis, MO,
- Soar Tutorial, 18 attendees, July 2004, ICCM Conference, Pittsburgh, PA.
- Soar Tutorial, 19 attendees, July 2004, AAAI, San Jose, CA.
- Soar Tutorial, 14 attendees, May 2004, 24th Soar Workshop, Ann Arbor, MI.
- Soar Tutorial, 25 attendees, May 2003, 23rd Soar Workshop, Ann Arbor, MI,
- Soar Tutorial, 20 attendees, May 2002, 22nd Soar Workshop, Ann Arbor, MI,

- AI & Computer Games, 180 attendees, March 2002, Game Developer Conference, with Michael van Lent.
- Computer Games and AI, 50 attendees, August 2001, International Joint Conference on Artificial Intelligence, with Michael van Lent.
- AI Tactical Decision Making Techniques, 50 attendees, May 2001, Computer Generated Forces and Behavior Representation, with Michael van Lent.
- Soar Tutorial, 12 attendees, May 2001, 21st Soar Workshop, Ann Arbor, MI,
- AI Tactical Decision Making Techniques, 200 attendees, March 2001, Game Developers Conference, San Jose, CA. with Michael van Lent.
- AI and Computer Games, 120 attendees, March 2001, Game Developers Conference.
- Computer Games, 20 attendees, September 2000, Washington D.C., with Michael van Lent.
- Soar Tutorial, 10 attendees. June 2000. Middlesex University.
- Soar Tutorial, 12 attendees. May 2000. 20th Soar Workshop.
- Soar Tutorial, 16 attendees. May 1999. 19th Soar Workshop.
- Agent Development in Soar. 24 attendees. July 26, 1997. National Conference on Artificial Intelligence. Providence, Rhode Island.
- Agent Development in Soar. 20 attendees, July 16-17, 1997. University of Michigan. Soar/IFOR Tutorials. Two five day tutorials, Summer of 1996. 24 attendees.
- Soar/IFOR Tutorials. One five day tutorials, Summer of 1995. 13 attendees.
- Organized UM workshop on Cognitive Science and Cognitive Neuroscience, May 31, 1995.
- Soar Tutorial, The 12th Annual Conference of The Cognitive Science Society, Boston, MA, June 1990.
- Integrating Knowledge Acquisition and Machine Learning, Autumn School at Campus Thomson, Paris, France. Sponsored by the Institut d'Expertise et de Prospective de l'Ecole Normale Supérieure and Thomson, Sept. 6, 1989.
- Soar Tutorial, The 11th Annual Conference of the Cognitive Science Society, The University of Michigan, Aug. 15, 1989.
- Three presentations at the Soar Tutorial and Workshop, The University of Groningen, The Netherlands, June 18-22, 1989.