

Bobby D. Bryant

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Curriculum Vitae

Professional Preparation

University of Houston	Classical Studies	BA <i>summa cum laude</i>	1995
The University of Texas at Austin	Computer Sciences	MSCS	1999
The University of Texas at Austin	Computer Sciences	PhD	2006
		Advisor: Risto Miikkulainen	

Appointments

Assistant Professor	University of Nevada, Reno	2006–present
UNR Technical Point of Contact	Cyber Conflict Research Consortium (CCRC)	2008–present

Laboratories

Director, Neuroevolution and Behavior Laboratory (NEBL)	2007–present
Director, CCRC Agent Modeling Laboratory (CAML)	2008–present

Publications

- Rakhi C. Motwani, Bobby D. Bryant, and Frederick C. Harris Jr. (2010). Watermark Embedder Optimization for 3D Mesh Objects using Support Vector Machine. To appear in *Proceedings of the 2010 International Conference on Signal Acquisition and Processing (ICSAP 2010)*.
- Matt Parker and Bobby D. Bryant (2009). Backpropagation without Human Supervision for Visual Control in Quake II. *Proceedings of the 2009 IEEE Symposium on Computational Intelligence and Games (CIG'09)*, pp. 287–293. Piscataway, NJ: IEEE Press.
<http://nebl.cse.unr.edu/archive/papers/parker-2009-cig.pdf>
- Matt Parker and Bobby D. Bryant (2009). Lamarckian Neuroevolution for Visual Control in the Quake II Environment. *Proceedings of the 2009 IEEE Congress on Evolutionary Computation (CEC 2009)*, pp. 2630–2637. Piscataway, NJ: IEEE Press.
<http://nebl.cse.unr.edu/archive/papers/parker-2009-cec.pdf>
- Matt Parker and Bobby D. Bryant (2008). Visual Control in Quake II with a Cyclic Controller. *Proceedings of the 2008 IEEE Symposium on Computational Intelligence and Games (CIG'08)*, pp. 151–158. Piscataway, NJ: IEEE Press.
<http://nebl.cse.unr.edu/archive/papers/parker-2008-cig.pdf>

- Matt Parker and Bobby D. Bryant (2008). Neuro-visual Control in the Quake II Game Engine. *Proceedings of the 2008 International Joint Conference on Neural Networks (IJCNN 2008)*, pp. 3827-3832. Piscataway, NJ: IEEE Press.
<http://nebl.cse.unr.edu/archive/papers/parker-2008-ijcnn.pdf>
- Nathan A. Penrod, David Carr, Sushil Louis, and Bobby D. Bryant (2008). Neuro-evolving Maintain-Station Behavior for Realistically Simulated Boats. *Proceedings of the 2008 IEEE Congress on Evolutionary Computation (CEC 2008)*, pp. 3326-3332. Piscataway, NJ: IEEE Press.
<http://nebl.cse.unr.edu/archive/papers/penrod-2008-cec.pdf>
- Bobby D. Bryant and Risto Miikkulainen (2007). Acquiring Visibly Intelligent Behavior with Example-Guided Neuroevolution. *Proceedings of the Twenty-Second National Conference on Artificial Intelligence (AAAI-07)*, pp. 801-808. Menlo Park, CA: AAAI Press.
<http://www.cse.unr.edu/~bdbryant/papers/bryant.aaai07.pdf>
- Risto Miikkulainen, Bobby D. Bryant, Ryan Cornelius, Igor V. Karpov, Kenneth O. Stanley, and Chern Han Yong (2006). Computational Intelligence in Games. In Gary Y. Yen and David B. Fogel (editors), *Computational Intelligence: Principles and Practice*, pp. 155-191. IEEE Computational Intelligence Society. Piscataway, NJ: IEEE.
<http://www.cse.unr.edu/~bdbryant/papers/miikkulainen.wcci06.pdf>
- Kenneth O. Stanley, Bobby D. Bryant, Igor Karpov, Risto Miikkulainen (2006). Real-Time Evolution of Neural Networks in the NERO Video Game. *Proceedings of the Twenty-First National Conference on Artificial Intelligence (AAAI-06)*, pp. 1671-1674. Menlo Park, CA: AAAI Press.
<http://www.cse.unr.edu/~bdbryant/papers/stanley.aaai06.pdf>
- Bobby D. Bryant and Risto Miikkulainen (2006). Evolving Stochastic Controller Networks for Intelligent Game Agents. *Proceedings of the 2006 Congress on Evolutionary Computation (CEC 2006)*, pp. 1007-1014. Piscataway, NJ: IEEE.
<http://www.cse.unr.edu/~bdbryant/papers/bryant.cec06.pdf>
- Bobby D. Bryant and Risto Miikkulainen (2006). Exploiting Sensor Symmetries in Example-based Training for Intelligent Agents. *Proceedings of the 2006 IEEE Symposium on Computational Intelligence and Games (CIG'06)*, pp. 90-97. Piscataway, NJ: IEEE.
<http://www.cse.unr.edu/~bdbryant/papers/bryant.cig06.pdf>
- Bryant, Bobby D. (2006). *Evolving Visibly Intelligent Behavior for Embedded Game Agents*. PhD thesis, Department of Computer Sciences, The University of Texas at Austin. Austin, TX.
<http://www.cse.unr.edu/~bdbryant/papers/bryant.utcstr06.pdf> (as UTCS Technical Report AI-06-334.)
- Kenneth O. Stanley, Bobby D. Bryant, and Risto Miikkulainen (2005). Real-time Neuroevolution in the NERO Video Game. *IEEE Transactions on Evolutionary Computation*, Vol. 9, No. 6, pp. 653-668. Piscataway, NJ: IEEE.
<http://www.cse.unr.edu/~bdbryant/papers/stanley.ieeetec05.pdf>
- Kenneth O. Stanley, Bobby D. Bryant, and Risto Miikkulainen (2005). Evolving Neural Network Agents in the NERO Video Game. *Proceedings of the IEEE 2005 Symposium on Computational Intelligence and Games (CIG'05)*, pp. 182-189. Piscataway, NJ: IEEE.
<http://www.cse.unr.edu/~bdbryant/papers/stanley.cig05.pdf>

Bobby D. Bryant and Risto Miikkulainen (2003). Neuroevolution for Adaptive Teams. *Proceedings of the 2003 Congress on Evolutionary Computation (CEC'03)*, pp. 2194-2201. Piscataway, NJ: IEEE.

<http://www.cse.unr.edu/~bdbryant/papers/bryant.cec03.pdf>

Kenneth O. Stanley, Bobby D. Bryant, and Risto Miikkulainen (2003). Evolving Adaptive Neural Networks with and without Adaptive Synapses. *Proceedings of the 2003 IEEE Congress on Evolutionary Computation (CEC'03)*, Vol. 4, pp. 2557-2564. Piscataway, NJ: IEEE.

<http://www.cse.unr.edu/~bdbryant/papers/stanley.cec03.pdf>

Bobby D. Bryant and Risto Miikkulainen (2001). From Word Stream to Gestalt: A Direct Semantic Parse for Complex Sentences. AI Technical Report TR-AI98-274, Department of Computer Sciences, The University of Texas at Austin. Austin, TX.

<http://www.cse.unr.edu/~bdbryant/papers/bryant.utcstr98.pdf>

All publications are available at <http://www.cse.unr.edu/~bdbryant/>.

Invited Talks

“Visibly Intelligent Agents for Games and Simulators: Creating Adaptive Teams with Example-Guided Evolution”. University of Nevada, Reno (May 2006).

“Neuroevolution for Adaptive Teams: Learning Heterogeneous Behavior in Homogeneous Multi-Agent Systems”. Digital Media Collaboratory *GameDev* Conference (August 2003)

Tutorials

“Inductive Agent Modeling in Games”. IEEE Symposium on Computational Intelligence in Games (December 2008).

Other Talks

“A ‘Second Life’ in Classroom Management Training? Enhancing Culturally Relevant Classroom Management Knowledge in the Virtual World of Second Life”. Symposium on Gaming and Virtual Worlds, 2009 Annual Meeting of the American Educational Research Association (April 2009). Co-presentation with Jennifer Mahon, Department of Curriculum, Teaching, and Learning, University of Nevada, Reno.

Funding

“Web*DECIDE” (PI), \$786,000. Sponsored by DHS (via NUARI subcontract), 2008–2010.

“Nevada Educational Game Laboratory Upgrade” (PI), \$26,500 + \$10,000 matching funds from Department and College. Sponsored by UNR IT, 2008.

“Co-Evolving Competent Strategies for Training and Decision Support” (co-PI), \$620,709 + \$126,078 NSHE matching funds. Sponsored by DOD/DON (DEPSCoR), 2008–2011.

“Exploration of Research Directions to Provide Solutions for Improving Quality Assurance at Bally Technologies” (co-PI), \$62,972 + \$35,714 ARI matching funds. Sponsored by Bally Technologies, Inc., 2007-2008.

“Workshop: Behavior Analysis in Artificial and Simulated Agents” (PI), \$3,635. Sponsored by NSF (via Nevada EPSCoR), 2007.

“The Excitement of the Arcade” (co-PI), \$1,650. Sponsored by UNR IEG, 2007.

Other Proposals Submitted (not awarded)

“Utilizing a Web-Based Artificial Intelligence Driven Simulation to Enhance Teacher Abilities to Facilitate K-12 STEM Learning” (co-PI), \$424,086. NSF, 2009.

“CAREER: Acquiring Visibility Intelligent Behavior via Example-Guided Neuroevolution” (PI), \$561,209. NSF, 2007.

“InteRactive Intelligent Systems (IRIS)” (co-PI), \$4,499,762. NSF EPSCoR, 2007.

“A Simulation Infrastructure for Situated Intelligence” (PI), \$480,045. NSF, 2007.

“A Spacetime Approach to Multi-Agent Coordination” (PI), \$298,276. NSF, 2007.

“Collaborative Interactive Evolution for Creative Design and Education” (co-PI), \$799,134. NSF, 2007.

“Foundations of Neurovisual Control” (PI), \$449,004. NSF, 2007.

“A New Approach to spatial Data Authentication Using Mathematical Visualization” (co-PI), \$500,000. NSF, 2007.

“Sloan Research Fellowship” (PI), \$45,000. Alfred P. Sloan Foundation, 2007.

“Inducing Meta-Level Gene Regulatory Network Models from Biological Data” (PI), \$135,000. NIH (via Nevada INBRE), 2007.

“A Simulation Infrastructure for Computational Intelligence” (PI), \$497,937. NSF, 2006.

Awards

CIG’06 Best Student Paper, for “Exploiting Sensor Symmetries in Example-based Training for Intelligent Agents”.

CIG’05 Best Paper, for “Evolving Neural Network Agents in the NERO Video Game”.

Digital Media Collaboratory Fellowship, for the study of example-guided evolution (three semesters at UT-Austin).

Service

Technical Committees: Member, IEEE Computational Intelligence Society’s Technical Committee on Games (2007-)

Task Forces: Chair, Task Force on Real-Time Strategy Games [for the IEEE Computational Intelligence Society’s Technical Committee on Games](2007-2008, Assistant Chair 2009-); Assistant Chair, Task Force on Player Satisfaction Modelling (for the IEEE Computational Intelligence Society’s Technical Committee on Games)(2007-)

Program Committees: Organizer, Workshop on Behavior Analysis for Artificial and Simulated Agents (2007); Member, IEEE Symposium on Computational Intelligence in Games (2007); Member, Workshop on Optimizing Player Satisfaction in Computer and Physical Games (2006-2008)

Reviewer: Artificial Intelligence; Artificial Intelligence Review; Evolutionary Computation; Genetic Programming and Evolvable Machines; IEEE Symposium on Computational Intelligence and Games; IEEE Transactions on Evolutionary Computation; IEEE Transactions on Systems, Man and Cybernetics - Part B; International Conference on Parallel Problem Solving From Nature; Workshop on Optimizing Player Satisfaction in Computer and Physical Games; World Congress on Computational Intelligence

Departmental Committees: Chair, Student Relations and Activities Committee (2008-) Member, Computer Science and Engineering Curriculum Committee (2006-); Member, CSE/EBE Colloquium Committee (2008-);

University Committees: Member, Grid System Administrator Search Committee (2007); Member, Grid Systems Steering Committee (2007-)

Society Memberships: AAAI (2007-); ACM (2006-); ASEE (2006-); IEEE (2003-); ISAB (2006-)

Courses Taught

CS 381 The Game Development Pipeline
CS 481/681 Advanced Game Design
CS 482R/682R Artificial Intelligence
CS 483R/683R Artificial Intelligence Programming
CS 491s/691s Neural Networks
CS 493Q Directed Study: Machine Learning
CS 493R Directed Study: Modeling and Simulation
CS 493W Directed Study: Programming Languages
CS 709c Discrete Systems Simulation
CS 790Q Seminar: Machine Learning
CS 793R Independent Study: Modeling and Simulation

Courses Developed

CS 381 The Game Development Pipeline

Graduated Advisees

Radha Gurugubelli (M.S. 2008)

Matt Parker (M.S. 2009)

Dat Ta (M.S. 2008)

Mikhail Utkin (M.S. 2009)

Current Advisees

One Ph.D. student

Five M.S. students

Two undergraduate researchers

Two research interns from the Davidson Academy of Nevada