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INTERESTS Interactive Virtual Experiences, Artificial Intelligence, Drama Management, Computational Social Psychology, Multiagent Systems, Simulation

EDUCATION Ph.D., Computer Science, Expected May 2010; GPA: 4.0 / 4.0
Concentration: Artificial Intelligence, Machine Learning, Social Psychology, and Human-Computer Interaction Applied to Interactive Virtual Experiences
Advisor: Professor Charles Isbell
School of Interactive Computing
College of Computing
Georgia Institute of Technology
Atlanta, GA

B.A., Magna Cum Laude, May 2003
Majors: Computer Science and Mathematics
Colgate University
Hamilton, NY

JOURNAL PUBLICATIONS

- [1] David L. Roberts and Charles L. Isbell. A survey and qualitative analysis of recent advances in drama management. *International Transactions on Systems Science and Applications, Special Issue on Agent Based Systems for Human Learning*, 3(1):61–75, 2008.
- [2] David L. Roberts, Charles L. Isbell, and Michael L. Littman. Optimization problems involving collections of dependent objects. *Annals of Operations Research, Special Issue on Decision Theory and Computer Science*, 163(1):255–270, 2008.
- [3] David L. Roberts and Fred S. Roberts. Locating sensors in paths and cycles: The case of 2-identifying codes. *European Journal of Combinatorics*, 29(1):72–82, 2008.
- [4] Mark J. Nelson, Michael Mateas, David L. Roberts, and Charles L. Isbell. Declarative optimization-based drama management in interactive fiction. *IEEE Computer Graphics and Applications, Special Issue on Interactive Narrative*, 26(3):30–39, 2006.

REFEREED CONFERENCE PUBLICATIONS

- [1] David L. Roberts, Mark O. Riedl, and Charles L. Isbell. Beyond adversarial: The case of game AI as storytelling. In *Breaking New Ground: Innovation in Games, Play, Practice and Theory, Proceedings of the Digital Games Research Association 2009 Conference (DIGRA 2009)*, 2009.
- [2] David L. Roberts, Merrick L. Furst, Charles L. Isbell, and Brian Dorn. Using influence and persuasion to shape player experiences. In *2009 Sandbox: ACM SIGGRAPH Video Game Proceedings (SIGGRAPH Sandbox)*, 2009.

- [3] David L. Roberts, Charles L. Isbell, Mark O. Riedl, Ian Bogost, and Merrick L. Furst. On the use of computational models of influence for interactive virtual experience management. In *Proceedings of the First International Conference on Interactive Digital Storytelling*, 2008.
- [4] David L. Roberts, Sooraj Bhat, Kenny St. Clair, and Charles L. Isbell. Authorial idioms for target distributions in ttd-mdps. In *Proceedings of the 22nd Conference on Artificial Intelligence (AAAI-07)*, 2007.
27% acceptance rate. Indicated as accepted in the top 5% of submissions.
- [5] David L. Roberts, Andrew S. Cantino, and Charles L. Isbell. Player autonomy versus designer intent: A case study of interactive tour guides. In *Proceedings of the Third Conference on Artificial Intelligence for Interactive Digital Entertainment (AIIDE-07)*, 2007.
- [6] Sooraj Bhat, David L. Roberts, Mark J. Nelson, Charles L. Isbell, and Michael Mateas. A globally optimal online algorithm for TTD-MDPs. In *Proceedings of the Sixth International Joint Conference on Autonomous Agents and Multiagent Systems (AAMAS-07)*, 2007.
22% acceptance rate.
- [7] Andrew Cantino, David L. Roberts, and Charles L. Isbell. Autonomous nondeterministic tour guides: Improving quality of experience with TTD-MDPs. In *Proceedings of the Sixth International Joint Conference on Autonomous Agents and Multiagent Systems (AAMAS-07)*, 2007.
47% acceptance rate (short papers).
- [8] David L. Roberts, Mark J. Nelson, Charles L. Isbell, Michael Mateas, and Michael L. Littman. Targeting specific distributions of trajectories in MDPs. In *Proceedings of the 21st National Conference on Artificial Intelligence (AAAI-06)*, 2006.
30% acceptance rate.
- [9] Mark J. Nelson, David L. Roberts, Charles L. Isbell, and Michael Mateas. Reinforcement learning for declarative optimization-based drama management. In *Proceedings of the Fifth International Joint Conference on Autonomous Agents and Multiagent Systems (AAMAS 06)*, 2006.
23% acceptance rate.
- [10] David L. Roberts, Sooraj Bhat, Charles L. Isbell, Brian F. Cooper, and Jeffrey S. Pierce. A decision-theoretic approach to file consistency in constrained peer-to-peer device networks. In *Proceedings of the Fifth International Joint Conference on Autonomous Agents and Multiagent Systems (AAMAS 06)*, 2006.
47% acceptance rate (short papers).

REFEREED
WORKSHOP
PUBLICATIONS

- [1] David L. Roberts, Harikrishna Narayanan, and Charles L. Isbell. Learning to influence emotional responses for interactive storytelling. In *Proceedings of the AAAI 2009 Spring Symposium on Intelligent Narrative Technologies II*, 2009.
- [2] David L. Roberts. Computational influence for training and education. In *Proceedings of the AAAI 2008 Doctoral Consortium*, 2008.
32% acceptance rate.

- [3] Michael L. Best, Thomas N. Smyth, Hasan Abbasi, Corbin L. Pon, David L. Roberts, and Daniel Serrano-Baquero. Design of video-sharing kiosks for Liberia's post-conflict reconciliation. In *The CHI 2008 workshop on HCI for Community and International Development*, 2008.
- [4] David L. Roberts, Christina R. Strong, and Charles L. Isbell. Using feature value distributions to estimate player satisfaction through an author's eyes. In *Proceedings of the AAAI 2007 Fall Symposium on Intelligent Narrative Technologies*, 2007.
- [5] David L. Roberts, Christina R. Strong, and Charles L. Isbell. Estimating player satisfaction through the author's eyes. In *Proceedings of the Second Workshop on Optimizing Player Satisfaction*, 2007.
- [6] David L. Roberts and Charles L. Isbell. Desiderata for managers of interactive experiences: A survey of recent advances in drama management. In *Proceedings of the First Workshop on Agent-Based Systems for Human Learning and Entertainment (ABSHLE 07)*, 2007.
- [7] David L. Roberts and Tina Eliassi-Rad. A position paper: Value of information for evidence detection. In *Papers from the AAAI Fall Symposium on Capturing and Using Patterns for Evidence Detection*, October, 2006.
- [8] Thomas M. Parks and David L. Roberts. Distributed process networks in Java. In *Proceedings of the International Parallel and Distributed Processing Symposium, Workshop on Java for Parallel and Distributed Processing*, April 2003.

UNREFEREED
PAPERS

- [1] Michael L. Best, Daniel Serrano-Baquero, Corbin L. Pon, Thomas N. Smyth, David L. Roberts, and Hasan Abbasi. Video sharing as a tool for post-conflict reconciliation in Liberia. In *The 9th Global Information Technology Management Association (GITMA) World Conference*, 2008.
- [2] David L. Roberts, Mark Riedl, and Charles L. Isbell. Opportunities for machine learning to impact interactive narrative. In *NIPS 2007 workshop on Machine Learning and Games (MALAGA 07)*, 2007.
- [3] Andrew Cantino, David L. Roberts, and Charles L. Isbell. Autonomous nondeterministic tour guides: Improving quality of experience with TTD-MDPs. Technical Report GIT-IIC-07-02, College of Computing, Georgia Institute of Technology, 2007.
- [4] David L. Roberts and Fred S. Roberts. The paradoxical nature of locating sensors in paths and cycles: The case of 2-identifying codes. Technical Report 2006-02, DIMACS, Rutgers University, 2006.
- [5] David L. Roberts, Sooraj Bhat, Charles L. Isbell, Brian F. Cooper, and Jeffrey S. Pierce. A decision-theoretic approach to file consistency in constrained peer-to-peer device networks. Technical Report GIT-CC-06-05, College of Computing, Georgia Institute of Technology, 2006.
- [6] Brian F. Cooper, Charles L. Isbell, Jeffrey S. Pierce, David L. Roberts, and Sooraj Bhat. Accord: Middleware support for contextual ubiquitous data management on user devices. Technical Report GIT-CC-06-06, College of Computing, Georgia Institute of Technology, 2006.
- [7] David Koziol and David L. Roberts. Adaptive agent based simulations of global trade. In *Presentations at the National Conference for Undergraduate Research*, March 2003.

EXPERIENCE

Graduate Research Assistant
*Laboratory for Interactive
Artificial Intelligence*
Research program in Interactive Narrative based on the Declarative Optimization-based Drama Management framework. Studied approaches to balance between player self-agency and author's goals. Developed techniques for modeling player satisfaction with drama manager performance, providing variety of experience in repeated play, easing the authorial burden, and modeling influence as a tool for ensuring author's goals. Surveyed and analyzed recent advances in drama management technologies.

Georgia Institute of Technology

May 2005 – June 2006,

September 2006 – Present

Visiting Scholar
Center for Advanced Scientific Computing
Researched and defined value of information for evidence detection. Surveyed numerous fields for inspiration on methods to estimate value of information. Developed a learnable model of the value of information and experimented to verify its effectiveness.

Lawrence Livermore National Laboratory

June 2006 – August 2006

Summer Research Intern
Applied Research Department
Performed market research to identify relevant patents and potential partners for product development. Developed and tested software for remotely configuring network appliances according to an enterprise wide policy.

Telcordia Technologies

June 2003 – August 2003

Summer Research Assistant
Department of Computer Science
Created, implemented, tested, and documented a theoretical framework for process networks in Java.

Colgate University

June 2002 – September 2002

Network Administrator/Systems Programmer
Department of Computer Science
Installed, upgraded, and managed Sun Sparc workstations running Solaris and Intel workstations running Linux. Installed and administered a "Beowulf" parallel/distributed computation cluster.

Colgate University

November 1999 – May 2003

Systems Programmer
Department of Mathematics
Responsible for PC/workstation upgrade/repair/instructional support, network administration, web development. Began as an assistant and progressed to being given sole responsibility during supervisor's vacations for all network resources and users.

Rutgers University

July 1997 – January 2003

AWARDS

- Georgia Institute of Technology, School of Interactive Computing Ph.D. Student Research Excellence Commendation: December 2008.
- Georgia Institute of Technology President's Fellowship: August 2005 – Present.
- United States Department of Homeland Security Graduate Research Fellowship: September 2005 – August 2008.
- Honorable Mention, National Science Foundation Graduate Research Fellowship Competition: March 2005.

- High Honors in Computer Science, Colgate University: May 2003.
- Upsilon Pi Epsilon inductee: May 2003.
- Colgate University Computer Science Department Award for Excellence in Research: May 2003.
- Colgate University Computer Science Department Award for Outstanding Contributions to the Computer Science Community: May 2003.
- Honorable Mention Award, Syracuse Chapter Association for Computing Machinery Scholarship Competition Fall 2002.

INVITED LECTURES
AND PANELS

- *Computational Approaches to Shaping Player Experiences in Interactive Narratives*
Invited lecture, North Carolina State University, March 2009.
- *Authoring Support for Interactive Narratives*
Invited lecture, University of Hawai'i at Manoa, February 2009.
- *Authoring Interactive Virtual Experiences for Entertainment, Education, and Training.*
Invited lecture, Loyola Marymount University, September 2008.
- *The future of machine learning and games.*
Invited panelist at the NIPS 2007 workshop on Machine Learning and Games, December 2007.

TEACHING

- Guest Lecturer, Freshmen Leap
title: "Ethics: Where does the fault lie?"
Georgia Institute of Technology, College of Computing, October, November 2008.
- Guest Lecturer, Game Artificial Intelligence
title: "Drama Management in Interactive Narratives"
Georgia Institute of Technology, College of Computing, December 2006.
- Guest Lecturer, Game Artificial Intelligence
title: "Façade, World of Warcraft and Chess: What Makes an Interactive Narrative Interesting"
Georgia Institute of Technology, College of Computing, December 2006.
- Guest Lecturer, Natural Language Processing
title: "Value of Information for Evidence Detection"
Georgia Institute of Technology, College of Computing, October 2006.
- Teaching Assistant, CS 3911 Senior Design Project
Georgia Institute of Technology, College of Computing, August 2004 – May 2005.
- Teaching Assistant, COSC 465 Computer Networks
Colgate University Department of Computer Science, January 2003 – May 2003.
- Teaching Assistant, COSC 202 Discrete Structures
Colgate University Department of Computer Science, August 2002 – December 2002.
- Teaching Assistant, COSC 303 Design of Large Systems
Colgate University Department of Computer Science, January 2002 – May 2002.

ADVISING AND
MENTORING AT
GEORGIA TECH

- Harikrishna Narayanan, M.S. in Computer Science, Spring 2010 (expected)
Co-advised an M.S. research project on building and evaluating an Interactive Narrative System that led to a published paper.
- Kenneth St. Clair, B.S. in Computer Science, Spring 2008.
Co-advised an undergraduate research project that led to a published paper.
- Christopher Simpkins, Kenneth St. Clair and Christina Strong, Machine learning class project, Spring 2007
Mentored a semester-long class project on predicting the success of football plays from real-world data.
- Michael Helms, Maithilee Kunda and Liam MacDermed, Machine learning class project, Spring 2007
Mentored a semester-long class project on analyzing coaching tendencies in football play calls from real-world data.

PROFESSIONAL
ACTIVITIES

- NSF 2008 CreativeIT Program Workshop
Co-organizer
- Intelligent Narrative Technologies II, AAAI 2009 Spring Symposium
Symposium co-chair
- Transaction on Computational Intelligence and AI in Games
Reviewer: February, April 2009
- International Conference on Interactive Digital Storytelling
External reviewer: 2008
- Microsoft Research, Dream Build Play, Silicon Minds Challenge
Technical Program Committee member: 2008
- Intelligent Technologies for Interactive Entertainment (INTETAIN), workshop on Integrating Technologies for Interactive Stories (ITIS)
Technical Program Committee member: 2007
- International Conference on Autonomous Agents and Multiagent Systems, workshop on Agent Based Systems for Human Learning and Entertainment (ABSHLE)
Organizing Committee, Reviewer: 2007
Program Committee: 2009
- Association for the Advancement of Artificial Intelligence (AAAI)
External reviewer: 2005, 2006, 2007, 2008
- International Conference on Autonomous Agents and Multiagent Systems (AAMAS)
External reviewer: 2006, 2007, 2009
- Artificial Intelligence and Interactive Digital Entertainment (AIIDE)
External reviewer: 2007
- International Conference on Data Mining (ICDM)
External reviewer: 2006
- International Transactions on Systems Science and Applications (ITSSA), Special Issue on Agent Based Systems for Human Learning
Reviewer: 2007

SERVICE

- College of Computing, Georgia Institute of Technology, Graduate Steering Committee May 2007 - August 2009.
- College of Computing, Georgia Institute of Technology, Graduate Student Council President and Executive Committee leader: May 2007 - August 2009.
- Georgia Institute of Technology, Graduate Student Senator: September 2005 - May 2006.
- College of Computing, Georgia Institute of Technology, Graduate Student Council Computing and Networking Services Liaison: May 2005 - August 2007.
- College of Computing, Georgia Institute of Technology, Computing and Networking Services Advisory Committee: May 2005 - August 2007.
- College of Computing, Georgia Institute of Technology, Graduate Student Council Graduate Orientation Coordinator: May 2005 - May 2006.
- College of Computing, Georgia Institute of Technology, Graduate Student Council Ph.D. Recruiting Coordinator: December 2004 - May 2005.

REFERENCES

Professional, academic, and personal references available upon request.