

Jonathan Gratch

Institute for Creative Technologies
Department of Computer Science
University of Southern California
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Research Interests

Artificial Intelligence, cognitive science, emotion modeling, planning, multi-agent systems.

Education

Ph.D. in Computer Science, University of Illinois, June 1995
Thesis: On Efficient Approaches to the Utility Problem in Adaptive Problem Solving
DOCTORAL COMMITTEE: G. F. DeJong (Chair), J. I. Marden, L. B. Pitt, L. A. Rendell, M. J-P. Shaw

M.S. in Computer Science, University of Illinois, May 1993.
B.A. magna cum laude in Computer Science, University of Texas at Austin, May 1986.

Professional Experience

Institute for Creative Technologies, University of Southern California
Associate Director and Research Associate Professor. Head a group researching techniques for incorporating emotions, personality, and story into virtual training environments.
March 2007 - Present

Institute for Creative Technologies, University of Southern California
Project Leader and Research Associate Professor
July 2006 – March 2007

Institute for Creative Technologies, University of Southern California
Project Leader and Research Assistant Professor.
June 2000 - July 2006

Information Sciences Institute, University of Southern California

Computer Scientist and Research Assistant Professor.
Performed research and development into real-time planning techniques, multi-agent cooperative behavior, and behavioral modeling learning.
August 1995 - June 2000

Beckman Institute, University of Illinois at Urbana-Champaign
Research Assistant. Developed machine learning techniques for acquiring problem solving heuristics - research lead to significant problem solving improvements on the Deep Space Network scheduling system, a real-world scheduling application, and in several planning domains. Focused on both theoretical analysis of these learning techniques and their application to practical industrial problems.
Fall 1989 - July 1995

Jet Propulsion Laboratory, California Institute of Technology
Research Consultant. Worked on learning approach for the Deep Space Network scheduling project.
July 1992 - October 1992, February 1993, September 1994

University Service

Committees:

Graduate Student Assistantship Committee (2000-2003)
Research Faculty Merit Committee (2007)
Committee for Research Faculty Applications (2007-2008)

Courses:

CS534: Affective Computing, Spring 2007
CS541: Artificial Intelligence Planning, Fall 2000
CS593: Autonomous Learning and Discovery Agents, Fall 1997

Graduate Students:

Wenji Mao, PhD 2006
Thesis: Modeling Social Causality and Social Judgment in
Multi-agent Interactions
Anna Okhmatovskaia, M.S. 2006
Hyeoksoo Kim, PhD 2008
Thesis: A Planner-Independent Approach to Human-Computer Interactive
Planning
Celso de Melo
Ning Wang, PhD 2008
Lixing Huang

Dissertation Committees:

Hyeoksoo Kim (USC), Chair
Wenji Mao (USC), Chair
Nan Jing (USC), Member

Mei Si (USC), Member
Young-jun Kim (USC), Member
Evan Drumwright (USC), Member
Robert Marinier (University of Michigan), Member
Erdan Gu (University of Pennsylvania), Member
Janusz Marecki (USC), Member
Henriette van Vugt (Vrije Universiteit), Member
Matheen Siddiqu (USC), Member
Dusan Jan (USC), Member

Grants and Contracts

MAJOR: Collaborative Research: Modeling Creative and Emotive Improvisation in Theatre, NSF (2008-2010), Senior personal
Virtual Humans in Kinetic Environments, USC/ICT, \$500,000 (2008), PI
HCC: Building Rapport with Virtual Humans, NSF, \$450,000 (2007-9), PI
Collaborative Research—Dyadic rapport within and across cultures: Multimodal assessment of human-human and human-computer interaction, NSF \$650,000 (2007-2009), Co-PI
Quantifying the Human Interactional Efficacy of Advanced Virtual Human Agents for Training, U.S. Army RDECOM, \$116,000 (2008), PI
Is rapport in the eye, ear, or mind of the beholder? U.S. Army RDECOM, \$100,000 (2008), PI
Modeling and Validating Emotion's Impact on Cognition, AFOSR, \$540,000 (2006/07), Co-PI
SocSim, Bavaria California Technology Center, \$4000 (2006), Co-PI
Stress and Emotion Project, U.S. Army RDECOM, \$1,775,000 (2006-7), PI
Virtual Human Rapport, U.S. Army RDECOM, \$100,000 (2006), PI
HUMAINE Network on Emotion and Man-machine Interaction, EU, \$20,000 (2005-7), Co-PI
Stress and Emotion Project, U.S. Army RDECOM, \$867,000 (2005), PI
Stress and Emotion Project, Army Research Office, \$800,000 (2004), PI
Workshop on Perceptive Animated Interfaces and Virtual Humans, NSF, \$40,000, 2003, Co-PI
Stress and Emotion Project, Army Research Office, \$580,000 (2003), PI
Stress and Emotion Project, Army Research Office, \$398,000 (2002), PI
Emotional Synthetic Forces, Army Research Institute, \$294,000 (1997-2000), PI

Honors and Professional Activities

Editorial Board:

Associate Editor, Emotion Review (2007-2009)

Vice President, HUMAINE Association (2007-2013)

Program Chair or Co-Chair:

Affective Computing and Intelligent Interaction Conference, Tutorial Chair, 2007
Workshop on rapport and social emotions, Chair, 2007
International Workshop on Modeling the Cognitive Antecedents
and Consequences of Emotion, Co-chair, 2006
International Conference on Intelligent Virtual Agents, Chair, 2006
International Working Conference on Intelligent Virtual Agents, co-chair, 2006
International Workshop on Virtual Humans: Design Criteria, Techniques
and Case Studies for Creating and Evaluating Interactive
Experiences, Workshop Co-chair, 2004
Workshop on Accelerating Progress in Perceptive Animated Agents
and Virtual Humans, Workshop Co-chair, 2004
International Workshop on Virtual Humans, Workshop Co-chair, 2002
19th International Soar Workshop, Workshop Chair, 2000

Senior Programming Committee Member:

International Conference on Intelligent Virtual Agents, Organizing Committee (2006-)
Conference on Behavioral Representation in Modeling and Simulation (2007)
International Conference on Virtual Storytelling (2003)
National Conference on Artificial Intelligence (1998)

Program Committee Member:

International Symposium on Ubiquitous Virtual Reality (2008)
International Workshop on Social Computing (2008)
Cognitive Science Conference, Prize Committee (2007)
International Conference on Cognitive Modeling (2007)
International Society for Gesture Studies (2007)
International Conference on Autonomous Agents and Multiagent
Systems (2002-2008)
National Conference on Artificial Intelligence (1996, 1997, 1998,
2004, 2006)
Workshop on Perception and Interactive Technologies (2005, 2006)
International Conference on Affective Computing and Intelligent
Interaction (2005)
Portuguese Conference on Artificial Intelligence (2005)
Cognitive Science Conference (2004)
Conference on Behavior Representation in Modeling and Simulation (2003)
Conference on Computer Animation and Social Agents (2003)
International Conference on Autonomous Agents (2001)
International Conference on Virtual Storytelling (2001)
International Conference on Artificial Intelligence Planning
Systems (2000)
International Joint Conference on Artificial Intelligence (1997)
International EMCSR Symposium on Affective Computational Entities (2004)
IUI workshop on Affective Interactions (2005)
Workshop on Human-like Intelligent Interfaces (2004)
Workshop on Affective Dialogue Systems (2004)

AAAI Spring Symposium on Emotion Architectures (2004)
Workshop on Affective and Attitude User Modeling (2003)
International Working Conference on Intelligent Virtual Agents (2003)
Florida Artificial Intelligence Research Symposium (1998)

Reviewer:

Adaptive Behavior (2008)
Artificial Intelligence Journal (2007, 2008)
NSF Review Panel, CreativeIT program (2007)
Language and Speech (2007)
Journal of Natural Language Engineering (2007)
Cognition and Emotion (2006)
Transactions in Robotics (2006)
International Journal of Humanoid Robotics (2005, 2006)
Journal of Computer Science Technology (2006)
Eurographics (2005)
Journal of Cognitive Systems Research (2004, 2006)
Journal of Artificial Intelligence Research (2003, 2004)
AI Magazine (2002)
Journal of Visualization and Computer Animation (2002)
User Modeling and User-Adapted Interaction: An International Journal
(special Issue on User Modeling and Intelligent Agents. (2001)
IEEE Transactions on Systems, Man, and Cybernetic (special issue on
"Socially Intelligent Agents - The Human in the Loop"), 2001
NSF Career Proposal Review Panel, 1998
Machine Learning Journal (1996)
Journal of Artificial Intelligence Research (1996)
Journal of Decision Support Systems (1995)
Annals of Operation Research (1995)
National Conference on Artificial Intelligence Student Program (1994)
European Conference on Artificial Intelligence (1994)
Third International Workshop on Knowledge Compilation and Speed-up
Learning (1993)

Miscellaneous:

National Academy of Sciences: Committee member for study on Opportunities in
Basic Research in the Behavioral and Social Sciences for the US Military
Invited Research Fellow, Center for Advanced Media Research Amsterdam, Free
University Amsterdam (Summer, 2008)
US Joint Forces Command Study on Large-Scale Joint Experimentation
Enabled by Scalable Parallel Processor Computing
DARPA ISAT study on Mixed-Initiative Control and Monitoring within Human-Bot
Systems, 2001
Advisory Board Member, UCLA Center for Computational Social Science
Soar Advisory Board Member
Member of the International Society for Research on Emotions

Member of the American Association for Artificial Intelligence
Member of the HUMAINE Associate for research on emotion and human-machine interaction
Member of the Operations Research Society of America and the Institute of Management Sciences

Awards

Best Paper, Interservice/Industry Training, Simulation & Education Conference (I/ITSEC), Emerging Concepts and Innovative Technology track, 2007
Best Paper Finalist, Intelligent Virtual Agents 2007.
"Best of AAMAS" special issue article, Journal of Autonomous Agents and Multiagent Systems, 2005
Best Paper, Autonomous Agents and Multiagent Systems 2003, Innovative Systems Track
Best Paper, Autonomous Agents Conference 2001, Software Prototype Track
Recommended Reading List, Computer Generated Forces and Behavioral Simulation 2002
Best Paper, Computer Generated Forces and Behavioral Simulation 2001,
NASA Group Achievement Award for Advanced Development for the Deep Space Mission System, 1999

Invited Lectures, Seminars, and Colloquia:

Keynote speaker, International Symposium on Ubiquitous Virtual Reality, July 2008
Greifswald University, Department of Psychology, July 2008
Vrije University of Amsterdam, Joint colloquium for Media Psychology and Computer Science, June 2008
University of Duisburg-Essen, Department of Media and Social Psychology, June 2008
NSF Workshop on Human-Computer Interaction for 21st Century Discovery, April 2008
Future of Games Speaker Series, North Carolina State University, April 2008
National Academy of Sciences, Committee on Opportunities in Neuroscience for Future Army Applications, February 2008.
Pomona College, Computer Science Colloquium Series, December 2007
USC Conference on Emotion, Decision Making, and the Brain, August 2007
Computer Game Design Seminar, University of Applied Sciences, Augsburg, Germany, June 2007
National Academy of Sciences, Board on Army Science and Technology, Washington D.C., December 2006.
Technology and Social Behavior Speaker Series, Northwestern University, November, 2006

International Symposium on Robot and Human Interactive Communication (RO-MAN 2006), Hertfordshire, UK, Invited tutorial, September 2006

Novel Translational Research to Treat Social and Communication Deficits in Autism, Marina del Rey, CA, invited speaker, August 2006

Believable Agents Workshop, invited speaker, Marina del Rey, CA, August, 2006

International Conference on Artificial Intelligence and Interactive Digital Entertainment, Marina del Rey, CA, invited speaker, July 2006

ZiF-Zentrum für interdisziplinäre Forschung, invited speaker, Bielefeld, Germany, April 2006

Pedagogical Catalysts for Adaptable Leaders Workshop, invited speaker, Marina del Rey, CA, December 2005

University of Santa Barbara Research Center for Virtual Environments and Behavior, invited speaker, November 2005.

University of Michigan Automotive Research Center, invited speaker, Oct 2005

HUMAINE Network of Excellence on Emotion and Human-Machine Interaction, Invited panel speaker, Newcastle, Northern Ireland, June 2005, June 2006

DARPA Workshop on Technologically Enhanced Training Agents, Marina del Rey, April, 2005

Workshop on Integrated Models of Cognitive Systems, invited speaker, Saratoga Springs, NY, March 2005

Imagina: European Digital Content Creation Trade Show, invited panelist, Monte Carlo, February, 2005

Pell Center for International Relations and Public Policy, December 2004 Conference on Behavioral Representation in Modeling and Simulation, invited panelist, Arlington, VA, 2004

University of Chicago, Psychology Department, 2004 Dagstuhl-Seminar on Evaluating Embodied Conversational Agents, 2004

AAAI Spring Symposium on Affective Architectures, 2004, Invited panel organizer

University of Hertfordshire, Adaptive Systems Research Group, 2003

Soar Workshop, Michigan, 2003

University of Michigan, Psychology Department, 2003

Austrian Research Institute for Artificial Intelligence, 2003

Vienna Workshop on Educational Agents - More than Virtual Tutors, 2003

Symposium on The Dis/simulations of War and Peace, Brown University, 2003

IJCAI Cognitive Modeling Workshop, Acapulco, Mexico, 2003, Invited panel participant

Cognitive Architecture Workshop, Stanford, CA, 2003

Harvard University Artificial Intelligence Group (2002)
Keynote Speaker, PRICAI Workshop on Lifelike Animated Agents, Tokyo, Japan, 2002
Computational Social Sciences Conference, Lake Arrowhead, CA, 2002
Intelligent User Interfaces Conference, 2002, Invited panel participant
Keynote Speaker, Computer Animation Conference, Seoul, Korea, 2001
Conference on the New Biopolitics (Rational Choice is Nearly Dead), UCLA, 2000
Institute for Research in Cognitive Science, University of Pennsylvania, 2000
Workshop on Multiagent Spatial Modeling, UCLA, 2000
MIT Media Lab, 2000
Brown Department of Media and Cultural Studies, 2000
Watson Institute for International Studies, Virtual Y2K Conference, 1999
Jet Propulsion Laboratory, California Institute of Technology, 1992,1996
Duke University - Department of Computer Science, 1995
AT&T Bell Labs, 1995
University of California at Irvine - Department of Computer Science, 1995
Haverford College - Department of Computer Science, 1995
AAAI Spring Symposium on Goal Driven Learning, Stanford, CA, 1994
University of Iowa - Department of Management Sciences, 1992
NASA Ames Research Center, 1992

Journal Publications

Jonathan Gratch, Stacy Marsella and Paolo Petta, "Modeling the Antecedents and Consequences of Emotion," *Journal of Cognitive Systems Research* (in press)

Stacy Marsella and Jonathan Gratch, "EMA: A Model of Emotional Dynamics," *Journal of Cognitive Systems Research* (in press)

Wenji Mao and Jonathan Gratch. "Modeling Social Inference in Virtual Agents. *Journal of Artificial Intelligence and Society*. (in press).

Core, M. G., Traum, D., Lane, H. C., Swartout, W., Marsella, S., Gratch, J., and van Lent, M., "Teaching negotiation skills through practice and reflection with virtual humans," *Simulation*, 82, 2006, pp. 685-701

William Swartout, Jonathan Gratch, Randall Hill, Eduard Hovy, Stacy Marsella, Jeff Rickel and David Traum, "Toward Virtual Humans," *AI Magazine*, v.27(1) 2006

Jonathan Gratch and Stacy Marsella, "Evaluating a computational model of emotion," in *Journal of Autonomous Agents and Multiagent Systems*, Special Issue on the Best of AAMAS 2004, 11(1), July 2005, pp. 23-43.

Jonathan Gratch and Stacy Marsella, "Some Lessons for Emotion Psychology for the Design of Educational Agents," *Journal of Applied Artificial Intelligence* (special issue on "Educational Agents - Beyond Virtual Tutors"), vol. 19, 2005, 215-233.

Jonathan Gratch and Stacy Marsella, A Domain-independent Framework for Modeling Emotion, *Journal of Cognitive Systems Research*, Volume 5, Issue 4, 2004, Pages 269-306.

Randall W. Hill, Jr., Jonathan Gratch, Stacy Marsella, Jeff Rickel, William Swartout, and David Traum, "Virtual Humans in the Mission Rehearsal Exercise System," in *Kunstliche Intelligenz* special issue on Embodied Conversational Agents, AI number 4/03, pp. 5-10, 2003.

Jonathan Gratch and Stacy Marsella, Fight the way you train: the role and limits of emotions in training for combat, *Brown Journal of World Affairs*, vol. X, issue 1, 63-76, 2003.

Jonathan Gratch, Jeff Rickel, Elisabeth Andre, Norman Badler, Justine Cassell, and Eric Petajan, "Creating Interactive Virtual Humans: Some Assembly Required," in *IEEE Intelligent Systems* July/August 2002, pp. 54-63.

Jeff Rickel, Stacy Marsella, Jonathan Gratch, Randall Hill, David Traum and Bill Swartout, "Towards a New Generation of Virtual Humans for Interactive Experiences," in *IEEE Intelligent Systems* July/August 2002, pp. 32-38

Jonathan Gratch and Gerald DeJong, "A Decision-theoretic Approach to Adaptive Problem Solving," *Artificial Intelligence*, (88) 1-2, 1996, pp. 101-142.

Jonathan Gratch and Steve Chien, "Adaptive Problem-solving for Large-scale Scheduling Problems: A Case Study," *Journal of Artificial Intelligence Research* 4, 1996, pp. 365-396.

Steve Chien, Jonathan Gratch, and Michael Burl, "On the Efficient Allocation of Resources for Hypothesis Evaluation: A Statistical Approach," *IEEE Transaction on Pattern Analysis and Machine Learning (PAMI)*, 17(4), 1995, pp. 652-665.

Fully Refereed Conference Publications

Vadim Bulitko, Steven Solomon, Jonathan Gratch and Michael van Lent. Modeling Culturally and Emotionally Affected Behavior. Fourth Conference on Artificial Intelligence and Interactive Digital Entertainment, Stanford, CA, October 2008

Louis-Philippe Morency, Iwan de Kok, Jonathan Gratch, Predicting Listener Backchannels: A Probabilistic Multimodal Approach, *8th International Conference on Intelligent Virtual Agents*, Tokyo, Japan, September 2008

David Traum, Jonathan Gratch, Stacy Marsella, Jina Lee, Arno Hartholt, Multi-party, Multi-issue, Multi-strategy Negotiation for Multi-modal Virtual Agents, *8th International Conference on Intelligent Virtual Agents*, Tokyo, Japan, September 2008

Patrick Kenny, Thomas Parsons, Jonathan Gratch, Albert Rizzo, Evaluation of Justina: A Virtual Patient with PTSD, *8th International Conference on Intelligent Virtual Agents*, Tokyo, Japan, September 2008

Agreeable People Like Agreeable Virtual Humans, Sin-Hwa Kang, Jonathan Gratch, Ning Wang, James Watts, *8th International Conference on Intelligent Virtual Agents*, Tokyo, Japan, September 2008

Sinhwa Kang, Jonathan Gratch, Ning Wang, James Watt. Does Contingency of Agents' Nonverbal Feedback Affect Users' Social Anxiety? *7th International Conference on Autonomous Agents and Multiagent Systems*. Estoril, Portugal. May 2008.

Jonathan Gratch, Ning Wang, Jillian Gerten, Edward Fast, Robin Duffy. Creating Rapport with Virtual Agents. *7th International Conference on Intelligent Virtual Agents*, Paris, France, September 2007. **Best Paper Finalist**

Patrick Kenny, Thomas D. Parsons, Jonathan Gratch, Albert A. Rizzo. Virtual Patients for Clinical Therapist Skills Training. *7th International Conference on Intelligent Virtual Agents*, Paris, France, September 2007.

Gudný R. Jónsdóttir, Jonathan Gratch, Edward Fast, Kristinn R. Thórisson. Fluid Semantic Back-Channel Feedback in Dialogue: Challenges and Progress. *7th International Conference on Intelligent Virtual Agents*, Paris, France, September 2007.

Jina Lee, Stacy Marsella, David Traum, Jonathan Gratch and Brent Lance. The Rickel Gaze Model: A Window on the Mind of a Virtual Human. *7th International Conference on Intelligent Virtual Agents*, Paris, France, September 2007.

Sejin Oh, Jonathan Gratch, Woontack Woo. Explanatory Style for Socially Interactive Agents. *2nd International Conference on Affective Computing and Intelligent Interaction*, Lisbon, Portugal September 2007.

Paul Thagard, Peter Ditto, Jonathan Gratch, Stacy Marsella and Drew Westen. Emotional Cognition in the Real World. *Proceedings of the Twenty-Ninth Annual Meeting of the Cognitive Science Society*. Nashville, TN: Lawrence Erlbaum Associates. 2007

Patrick Kenny, Albert A. Rizzo, Thomas D. Parsons, Jonathan Gratch & William Swartout. A Virtual Human Agent for Training Novice Therapist Clinical Interviewing Skills. International Conference on Cybertherapy, 2007.

Kenny, P., Hartholt, A., Gratch, J., Traum, D., Marsella, S., Swartout, W., The More the Merrier: Multi-Party Negotiation with Virtual Humans, The Twenty-Second AAAI Conference on Artificial Intelligence (AAAI-07). (Intelligent Systems Demo Track), Vancouver, British Columbia, Canada. 2007

Gratch, J., Wang, N., Okhmatovskaia, A., Lamothe, F., Morales, M and Louis-Philippe Morency. Can virtual humans be more engaging than real ones? *12th International Conference on Human-Computer Interaction*, Beijing, China 2007

Jonathan Gratch, Stacy Marsella, Wenji Mao. Towards a Validated Model of "Emotional Intelligence." Twenty-First National Conference on Artificial Intelligence (AAAI06). Boston, MA. 2006

Jonathan Gratch, Anna Okhmatovskaia, Francois Lamothe, Stacy Marsella, Mathieu Morales, R. J. van der Werf and Louis-Philippe Morency. Virtual Rapport. 6th International Conference on Intelligent Virtual Agents, Marina del Rey, CA, 2006.

Stacy Marsella, Sharon Carnicke, Jonathan Gratch, Anya Okhmatovskaia and Albert Rizzo. An exploration of Delsarte's structural acting system 6th International Conference on Intelligent Virtual Agents, Marina del Rey, CA, 2006.

Gluck, K. A., Gunzelmann, G., Gratch, J., Hudlicka, E., & Ritter, F. Modeling the Impact of Cognitive Moderators on Human Cognition and Performance. In R. Sun & N. Miyake (Eds.), *Proceedings of the Twenty-Eighth Annual Meeting of the Cognitive Science Society*. Mahwah, NJ: Lawrence Erlbaum Associates. 2006.

Stacy Marsella and Jonathan Gratch, EMA: a computational model of appraisal dynamics, *Agent Construction and Emotion*, Vienna, 2006.

Wenji Mao and Jonathan Gratch, Evaluating a Computational Model of Social Causality and Responsibility, 5th International Joint Conference on Autonomous Agents and Multiagent Systems, Hakodate, Japan, 2006

Martijn Maatman, Jonathan Gratch and Stacy Marsella, Natural Behavior of a Listening Agent, 5th International Working Conference on Intelligent Virtual Agents, Kos, Greece, 2005.

Wenji Mao and Jonathan Gratch, Social Causality and Responsibility: Modeling and Evaluation, 5th International Working Conference on Intelligent Virtual Agents, Kos, Greece, 2005.

David Traum, William Swartout, Stacy Marsella and Jonathan Gratch, Fight, Flight, or Negotiate: Believable Strategies for Conversing under Crisis, 5th International Working Conference on Intelligent Virtual Agents, Kos, Greece, 2005.

Bilyana Martinovski, Wenji Mao, Jonathan Gratch and Stacy Marsella, "Mitigation Theory: An Integrated Approach," in Proceedings of the 27th Annual Conference of the Cognitive Science Society, Turin, Italy, 2005

Albert Rizzo, Jackie Morie, Josh Williams, Jarrell Pair, Jonathan Gratch, and J. G. Buckwalter, "Human Emotional State and its Relevance for Military VR Training" in the Proceedings of the 11th International Conference on Human Computer Interaction. L.A. Erlbaum: New York. 2005.

Jonathan Gratch and Stacy Marsella, "Evaluating the modeling and use of emotion in virtual humans," in Proceedings of the Third International Joint Conference on Autonomous Agents and Multiagent Systems, New York, New York, 2004.

Wenji Mao and Jonathan Gratch, "Social Judgment in Multiagent Interactions," in Proceedings of the Third International Joint Conference on Autonomous Agents and Multiagent Systems, New York, New York, 2004.

Hyeok-Soo Kim and Jonathan Gratch, "A Planner-Independent Collaborative Planning Assistant," in Proceedings of the Third International Joint Conference on Autonomous Agents and Multiagent Systems, New York, New York, 2004.

David Traum, Jeff Rickel, Jonathan Gratch, and Stacy Marsella, "Negotiation over tasks in hybrid human-agent teams for simulation-based training," in Proceedings of the Second International Joint Conference on Autonomous Agents and Multiagent Systems, Melbourne, Australia, 2003.

Best paper

Stacy Marsella and Jonathan Gratch, "Modeling Coping Behaviors in Virtual Humans: Don't worry, be happy," in Proceedings of the Second International Joint Conference on Autonomous Agents and Multiagent Systems, Melbourne, Australia, 2003.

Wenji Mao and Jonathan Gratch, "The Social Credit Assignment Problem" in 4th International Working Conference on Intelligent Virtual Agents, Kloster Irsee, Germany, 2003

Jonathan Gratch and Wenji Mao, "Automating After Action Review: Attributing Blame or Credit in Team Training," in 12th Conference on Behavior Representation in Modeling and Simulation, Scottsdale, AZ, May 2003

Stacy Marsella and Jonathan Gratch, "A step toward irrationality: using emotion to change belief," in Proceedings of the First International Joint Conference on Autonomous Agents and Multiagent Systems,

Bologna, Italy, 2002.

Randall Hill, Youngjun Kim and Jonathan Gratch, "Anticipating where to look: predicting the movements of mobile agents in complex terrain," in Proceedings of the First International Joint Conference on Autonomous Agents and Multiagent Systems, Bologna, Italy, 2002.

Jonathan Gratch and Stacy Marsella, "Tears and Fears: Modeling emotions and emotional behaviors in synthetic agents," in Proceedings of the 5th International Conference on Autonomous Agents, Montreal, Canada, June 2001

Stacy Marsella and Jonathan Gratch, "Modeling the Interplay of Emotions and Plans in Multi-Agent Simulations," in Proceedings of the 23rd Annual Conference of the Cognitive Science Society, Edinburgh, Scotland, 2001

Swartout, W., Hill, R., Gratch, J., Johnson, W.L., Kyriakakis, C., Labore, K., Lindheim, R., Marsella, S., Miraglia, D., Moore, B., Morie, J., Rickel, J., Thieboux, M., Tuch, L., Whitney, R. Toward the Holodeck: Integrating Graphics, Sound, Character and Story, in Proceedings of 5th International Conference on Autonomous Agents, Montreal, Canada, June 2001

Best paper

Jonathan Gratch, "Emile: Marshalling Passions in Training and Education," in Proceedings of the 4th International Conference on Autonomous Agents, Barcelona, Spain, June 2000

R. Hill, J. Gratch, P. Rosenbloom (2000). Flexible Group Behavior: Virtual Commanders for Synthetic Battlespaces. Proceedings of the Fourth International Conference on Autonomous Agents, Barcelona, Spain, June 2000.

Randall Hill, Johnny Chen, Jonathan Gratch, Paul Rosenbloom, Milind Tambe, "Intelligent Agents for the Synthetic Battlefield," in "Joint proceedings of the Fourteenth National Conference on Artificial Intelligence and the Ninth Conference on Innovative Applications of Artificial Intelligence (AAAI/IAAI97), Providence, RI, 1997, pp. 1006-1012.

Jonathan Gratch, "Sequential Inductive Learning," "Proceedings of Thirteenth National Conference on Artificial Intelligence (AAAI96), 1996, pp. 778-786

Jonathan Gratch, Steve Chien, and Gerald DeJong, "Improving Learning Performance Through Rational Resource Allocation," "Proceedings of the Twelfth National Conference on Artificial Intelligence (AAAI94), Seattle, WA, 1994, pp. 576-581.

Jonathan Gratch, Steve Chien, and Gerald DeJong, "Learning Search Control Knowledge for the Deep Space Network Scheduling Problem," Proceedings of the Tenth International Machine Learning Conference (ML93), Amherst, MA, 1993, pp. 135-142.

Jonathan Gratch and Gerald DeJong, "COMPOSER: A Probabilistic Solution to the Utility Problem in Speed-up Learning," Proceedings of the Tenth National Conference on Artificial Intelligence (AAAI92), San Jose, CA, 1992, pp. 235-240.

Jonathan Gratch and Gerald DeJong, "An Analysis of Learning to Plan as a Search Problem," "Proceedings of the Ninth International Machine Learning Conference (ML92), Aberdeen, Scotland, 1992, pp. 178-188.

Jonathan Gratch and Gerald DeJong, "A Hybrid Approach to Guaranteed Effective Control Strategies," "Proceedings of the Eighth International Workshop on Machine Learning (ML91), Evanston, IL, 1991, pp. 509-513.

Other Publications

Nicole Novielli, Peter Carnevale and Jonathan Gratch. Cooperation Attitude In Negotiation Dialogs. Proceedings of LREC2008 Workshop on Corpora for Research on Emotion and Affect, Marrakech, Morocco 2008

Celso de Melo, Jonathan Gratch, Evolving Expression of Emotions in Virtual Humans using Lights and Pixels, *8th International Conference on Intelligent Virtual Agents*, Tokyo, Japan, September 2008 (poster publication)

Committee on Opportunities in Basic Research in the Behavioral and Social Sciences for the U.S. Military (James J. Blascovich and Christine R. Hartel, Editors). *Human Behavior in Military Contexts*. National Academies Press. 2008

Patrick Kenny, Arno Hartholt, Jonathan Gratch, William Swartout, David Traum, Stacy Marsella, Diane Piepol. Building Interactive Virtual Humans for Training Environments. *Interservice/Industry Training, Simulation, and Education Conference (IITSEC) 2007*
Best Paper

Wenji Mao and Jonathan Gratch, "Modeling Social Inference in Virtual Agents," Workshop on Social Intelligence Design, Trento Italy, 2007.

Jonathan Gratch, "True emotion vs. Social Intentions in Nonverbal Communication: Towards a Synthesis for Embodied Conversational Agents," *Modeling Communication with Robots and Virtual Humans*, Wachmuth and Knoblich (eds.), LNAI 4930, Berlin, Springer, 2008.

Jonathan Gratch and Stacy Marsella, "The Architectural Role of Emotion in Cognitive Systems," in *Integrated Models of Cognitive Systems*, Wayne Gray (ed.), Oxford University Press, 2007

Jonathan Gratch, Anna Okhmatovskaia and Susan Duncan, Virtual Humans for the Study of Rapport in Cross-cultural Settings, in the 25th Annual Army Science Conference, Orlando, FL, 2006

Jonathan Gratch, Stacy Marsella, Arjan Egges, Anton Eliens, Katherine Isbister, Ana Paiva, Thomas Rist, Paul ten Hagen, "Design criteria, techniques and case studies for creating and evaluating interactive experiences for virtual humans, in Evaluating Embodied Conversational Agents, Zsofi Ruttkay, Elizabeth André, W. L. Johnson and Catherine Pelachaud (Eds.), Dagstuhl Seminar Proceedings 04121, 2006

Jonathan Gratch, Michael Young, Ruth Aylett, Daniel Ballin, Patrick Olivier, (eds.), Proceedings of the 6th International Conference on Intelligent Virtual Agents, in Lecture Notes in Computer Science, Volume 4113, Springer-Verlag GmbH, 2006

Themis Panayiotopoulos, Jonathan Gratch, Ruth Aylett, Daniel Ballin, Patrick Olivier, Thomas Rist (eds.), Proceedings of the 5th International Working Conference on Intelligent Virtual Agents, in Lecture Notes in Computer Science, Volume 3661, Springer-Verlag GmbH, 2006

Jonathan Gratch, Wenji Mao, and Stacy Marsella, "Modeling Social Attributions and Social Emotions in Soar," in Cognitive Modeling and Multi-Agent Interactions, Ron Sun (ed.), Cambridge University Press, 2006

Traum, D., Swartout, W., Gratch, J., Marsella, S., Kenny, P., Hovy, E., Narayanan, S., Fast, E., Martinovski, B., Baghat, R., Robinson, S., Marshall, A., Wang, D., Gandhe, S., Leuski, A. Dealing With Doctors: A Virtual Human for Non-team Interaction. Special Interest Group for Digital Linguistics (Sigdial), Lisbon, Portugal; September 2005.

W. Swartout, J. Gratch, R. Hill, E. Hovy, R. Lindheim, S. Marsella, J. Rickel, D. Traum, "Simulation meets Hollywood: Integrating Graphics, Sound, Story and Character for Immersive Simulation," Multimodal Intelligent Information Presentation, Eds. Oliviero Stock and Massimo Zancanaro, 2005.

Traum, D., Swartout, W., Gratch, J., Marsella, S. Virtual Humans for Non-team Interaction Training. Autonomous Agents and Multi-Agent Systems (AAMAS) Workshop on Creating Bonds with Humanoids (Utrecht, The Netherlands; July 2005).

Albert Rizzo, Jarrell Pair, Peter J. McNerney, Ernie Eastlund, Brian Manson, Jonathan Gratch, Randall Hill, Michael Roy and William Swartout, "Design and Development of a VR Therapy Application for Iraq War Veterans with PTSD." Proceedings of The 13th Annual Medicine Meets Virtual Reality Conference. Long Beach, CA. Jan. 2005

Jonathan Gratch and Stacy Marsella, "Towards a validated model of the influence of emotion on human performance," in the 24th Annual Army Science Conference, Orlando, FL, 2004

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