

**Curriculum Vitae**  
**Randall William Hill, Jr.**

**WORK ADDRESS**

USC Institute for Creative Technologies  
13274 Fiji Way  
Marina del Rey, CA 90292-7008  
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**HOME ADDRESS**

1198 East Mariposa Street  
Altadena, CA 91001  
(626) 798-2097

**EDUCATION**

*University of Southern California*

Ph.D., Computer Science, 1993

Dissertation: Impasse-Driven Tutoring for Reactive Skill Acquisition.

Advisor: W. Lewis Johnson, 1993.

*University of Southern California*

M.S., Computer Science, 1987

United States Military Academy, West Point,

B.S., 1978

**EMPLOYMENT SUMMARY**

*University of Southern California*

*Institute for Creative Technologies*

- October 2006 – Present: Executive Director
- December 2004 – October 2006: Director of Applied Research and Transition
- July 2001 – December 2004: Deputy Director of Technology
- June 2000 – July 2001: Senior Scientist

*University of Southern California*

*Information Sciences Institute*

- August 1997 – June 2000: Project Leader
- August 1995 – August 1997: Research Scientist

*California Institute of Technology*

*Jet Propulsion Laboratory*

- May 1994 – August 1995: Task Manager, Network Automation and Technical Group Supervisor
- December 1993 – May 1994: Technical Group Leader, Monitor and Control Technology Group
- October 1984 – December 1993: Member of Technical Staff

*United States Army*

- 1978—1984: Commissioned Field Artillery/Military Intelligence Officer
- 1984: Honorable discharge as Captain

## **ACADEMIC APPOINTMENT**

*University of Southern California, Computer Science Department*

1996 – Present: Research Assistant Professor

## **PH.D. STUDENTS**

- Advisor to Changhee Han, who graduated in 2004. Dissertation: Human-like movement of a virtual human using limited perception-based autonomous mapping in a virtual environment. As of 2008 he is serving as an associate professor of computer science at the Korean Military Academy in Seoul, Korea.
- Advisor to Youngjun Kim, who graduated in 2006. Dissertation: A computational model of dynamic perceptual attention for virtual humans. As of 2008 he is a senior engineer with Samsung Electronics, Korea, in their interactive media area.
- Currently serving on the committee for Amy Ogan, a PhD student at Carnegie Mellon University in Human Computer Interaction.

## **COURSES TAUGHT**

- CS561a, Graduate Introduction to Artificial Intelligence, Spring, 1998.
- CS569, Integrated Intelligence Systems, Spring, 2000.

## **PROFESSIONAL SERVICE**

### **Membership**

- American Association for Artificial Intelligence (AAAI)
- American Society for Engineering Education (ASEE)

### **Board of Reviewers**

- Space Mission Information Technology Review Board for Jet Propulsion Laboratory, December 8, 2004
- Reviewer for ACM SIGGRAPH 2003 Symposium on Interactive 3D Graphics.
- Reviewer for Journal on Autonomous Agents and Multi-Agent Systems, 2003.
- Reviewer for Autonomous Agents and Multiagent Systems (AAMAS) 2003.
- Reviewer for Journal of Visualization and Computer Animation, 2002.
- National Science Foundation panel, 1998.
- Fourth International Conference on Intelligent Tutoring Systems, 1998.
- Annual Meeting of the Cognitive Science Society, 1996.
- National Conference on Artificial Intelligence, Portland, Oregon, 1996.
- World Conference on Artificial Intelligence in Education, Washington, D.C., 1995.
- World Conference on Artificial Intelligence in Education, Edinburgh, Scotland, 1993.

### **Program Committee**

- Twenty-First Conference on Innovative Applications of Artificial Intelligence, July 2009, Pasadena, CA.
- Twentieth Conference on Innovative Applications of Artificial Intelligence, July 2008, Chicago, IL.
- Nineteenth Conference on Innovative Applications of Artificial Intelligence, July 22-26, 2007, Vancouver, British Columbia, Canada

- 6th International Working Conference on Intelligent Virtual Agents, August 21-23, 2006.
- Fifteenth Conference on Behavior Representation in Modeling and Simulation, May 15-18, 2006, Baltimore, MD.
- Eighteenth Conference on Innovative Applications of Artificial Intelligence, July 16-20, 2006, Boston, MA
- 5th International Working Conference on Intelligent Virtual Agents, September 12-14, 2005 Kos, Greece.
- Seventeenth Conference on Innovative Applications of Artificial Intelligence, July 2005, Pittsburgh, PA.
- Program Committee of the Fourteenth Conference on Behavior Representation in Modeling and Simulation, May 2005, Universal City, CA.
- Thirteenth Conference on Behavior Representation in Modeling and Simulation, May 2004.
- Third Americas School on Agents and Multi-Agent Systems, New York, New York, 2004.
- Twelfth Conference on Behavior Representation in Modeling and Simulation. May 2003.
- Workshop on AGENTS AT WORK - Autonomous Agents and Multi-agent Systems Autonomous Agents and Multiagent Systems (AAMAS) 2003.
- Fourteenth Innovative Applications of Artificial Intelligence Conference, Edmonton, Alberta, Canada, July 28-August 1, 2002.
- Thirteenth Innovative Applications of Artificial Intelligence Conference, Seattle, WA, August 7-9, 2001
- International Conference on Advanced Learning Technologies (ICALT2001)
- AAAI Fall 2000 Symposium on Simulating Human Agents

#### **Conference Chair**

- Chair of Sixteenth Conference on Innovative Applications of Artificial Intelligence, 2004, San Jose, CA.
- Co-Chair of Fifteenth Conference on Innovative Applications of Artificial Intelligence for 2003, Acapulco, Mexico.
- Chair of Second Americas School on Agents and Multi-Agent Systems, Acapulco, Mexico, August 8-11, 2003.
- Local Arrangements Chair, First Americas School on Agents and Multiagent Systems, Marina del Rey, CA, January 6-11, 2002.

#### **Editor**

- Special Issue of AI Magazine featuring papers from the Sixteenth Innovative Applications of Artificial Intelligence Conference, AAAI Press, Fall 2005.
- Proceedings of the Sixteenth Innovative Applications of Artificial Intelligence Conference, San Jose, CA, AAAI Press, 2004.
- Special Issue of AI Magazine featuring papers from the Fifteenth Innovative Applications of Artificial Intelligence Conference, AAAI Press, Fall, 2004.
- Proceedings of the Fifteenth Innovative Applications of Artificial Intelligence Conference, Acapulco, Mexico, AAAI Press, 2003.

## REFEREED JOURNAL ARTICLES

1. Kim, J., Hill, R., Durlach, P., Lane, H.C., Forbell, E., Core, M., Marsella, S., Pynadath, D., Hart, J. "BiLAT: A Game-based environment for practicing negotiation in a cultural context." *International Journal of Artificial Intelligence in Education*. (accepted)
2. Hill, R., Kim, J., Zbylut, M., Gordon, A., Ward, J. & Vowels, C. "Learning the lessons of leadership: Case method teaching with interactive, computer-based tools and film-based cases." Technical Report 1226, United States Army Research Institute for the Behavioral and Social Sciences, March 2008. (Peer reviewed and available online from <http://www.dtic.mil/dtic/>)
3. Zbylut, M., Metcalf, K., Kim, J., Hill, R., Rocher, S., and Vowels, C., (2007). "Army Excellence in Leadership (AXL): A multimedia approach to building tacit knowledge and cultural reasoning." Technical Report 1194, United States Army Research Institute for the Behavioral and Social Sciences, January 2007. (Peer reviewed and available online at <http://www.dtic.mil/dtic/>)
4. Swartout, W., Gratch, J., Hill, R., Hovy, E., R., Marsella, S., Rickel, J. and Traum, D. "Toward virtual humans." *AI Magazine*, Volume 27, Number 2, Summer, 2006.
5. R. Hill, J. Gratch, S. Marsella, J. Rickel, W. Swartout & D. Traum. "Virtual Humans in the Mission Rehearsal Exercise System." *Künstliche Intelligenz (KI Journal)*. Special issue on Embodied Conversational Agents, 2003.
6. R. Hill, C. Han, M. van Lent. "Perceptually Driven Cognitive Mapping in a Virtual Urban Environment." *AI Magazine*, Volume 23, Number 4, Winter 2002.
7. J. Rickel, S. Marsella, J. Gratch, R. Hill, D. Traum and W. Swartout. "Towards a New Generation of Virtual Humans for Interactive Experiences." *IEEE Intelligent Systems*, July/August 2002, pp. 32-38.
8. R. Hill, S. Chien, and K. Fayyad. "Goal-driven Automation of a Deep Space Communications Station: A Case Study in Knowledge Engineering for Plan Generation and Execution." *Expert Systems*, Vol. 15, No. 3, November 1998, pp. 141-156.
9. S. Chien, T. Estlin, X. Wang, A. Govindjee, R. Hill. "Automated Generation of Antenna Operations Procedures: A Knowledge-based Approach." *Telecommunications and Data Acquisition Reports* 42-130, April-June 1997.
10. S. A. Chien, A. Govindjee, T. Estlin, X. Wang, and R. Hill. "Integrating Hierarchical Task Network and Operator-based Planning Techniques to Automate Operations of Communications Antennas." *IEEE Expert*, December 1996.

11. R. Hill, and W.L. Johnson. "Situated plan attribution." *Journal of Artificial Intelligence in Education*, 6(1), 1995.
12. R. Hill, S. Chien, K. Fayyad, C. Smyth, T. Santos, R. Chen, R. Bevan. "Sequence of Events driven automation of the Deep Space Network." *Telecommunications and Data Acquisition Report*, 42-124, Oct-Dec, 1995.
13. L. Gasser and R. Hill. "Engineering coordinated problem solvers," *Annual Review of Computer Science*. Palo Alto: Annual Reviews, Inc., 1990.

#### **REFEREED CONFERENCES AND WORKSHOPS**

1. Kim, J., Hill, R. and Zbylut, M. (2007). "Film-based cases in Interactive Learning Environments for Leaders." Supplementary Proceedings of the 13th International Conference on Artificial Intelligence in Education from the Workshop on Narrative Learning Environments, 2007, Marina del Rey, CA.
2. Hill, R., Kim, J., Zbylut, M., Gordon, A., and Traum, D. (2006). "AXL.Net: Web-enabled case method instruction for accelerating tacit knowledge acquisition in leaders." Proceedings of the 25th Army Science Conference, Nov 27-30, 2006, Orlando, FL.
3. Hill, R., Belanich, J., Lane, H.C., Core, M., Dixon, M., Forbell, E., Kim, J., and Hart, J. (2006). "Pedagogically structured game-based training: Development of the ELECT BILAT simulation." Proceedings of the 25th Army Science Conference, Nov 27-30, 2006, Orlando, FL.
4. Riedl, M., Lane, H.C., Hill, R. & Swartout, W. (2005). "Automated Story Direction and Intelligent Tutoring: Toward a Unifying Architecture." Proceedings of the AIED 2005 Workshop on Narrative Learning Environments, July 2005.
5. Kim, Y., van Velsen, M., Hill, R. (2005). "Modeling Dynamic Perceptual Attention in a Complex Virtual Environment." Proceedings of the 5th International Conference on Intelligent Virtual Agents, Kos, Greece.
6. Kim, Y., Hill, R., and Traum, D. (2005). "A Computational Model of Dynamic Perceptual Attention for Virtual Humans." Proceedings of the 2005 Conference on Behavior Representation in Modeling and Simulation (BRIMS), May 16-19, 2005, Universal City, CA.
7. Kim, Y., Hill, R., and Traum, D. "Controlling the Focus of Perceptual Attention in Embodied Conversational Agents." Proceedings of the Fourth International Joint Conference on Autonomous Agents and Multiagent Systems (AAMAS05).
8. Hill, R., Gordon, A., Kim, J. "Learning the Lessons of Leadership Experience: Tools for Interactive Case Method Analysis." Proceedings of the 24th Army Science Conference, Nov 29 - Dec 2, 2004, Orlando, FL.

9. Swartout, W., Gratch, J., Hill, R.W. Jr., Hovy, E., Marsella, S., Rickel, J., Traum, D.R. "Toward Virtual Humans." Proceedings of the AAAI Fall Symposium on Achieving Human-Level Intelligence through Integrated Systems and Research. Crystal City, Virginia, October 2004.
10. Rizzo, A.A., Pair, J., McNerney, P.J., Eastlund, E., Manson, B., Gratch, J., Hill, R., Roy, M. & Swartout, W. "An Immersive Virtual Reality Therapy Application for Iraq War Veterans with PTSD: From Training to Toy to Treatment." Proceedings of the 24th Annual Army Science Conference. Orlando FL, 2004.
11. Rizzo, A.A., Pair, J., McNerney, P.J., Eastlund, E., Manson, B., Gratch, J., Hill, R., Roy, M. & Swartout, W. "From Training to Toy to Treatment: Design and Development of a Post Traumatic Stress Disorder Virtual Reality Therapy Application for Iraq War Veterans." Proceedings of the 3rd Annual International Workshop on Virtual Rehabilitation. 35-42, 2004.
12. R. Hill, J. Douglas, A. Gordon, F. Pighin & M. van Velsen. "Guided Conversations about Leadership: Mentoring with Movies and Interactive Characters." Proceedings of the Fifteenth Conference on Innovative Applications of Artificial Intelligence, Aug 12-14, 2003, Acapulco, Mexico, AAAI Press.
13. R. Hill, C. Han, M. van Lent. "Applying Perceptually Driven Cognitive Mapping to Virtual Urban Environments." Fourteenth Annual Conference on Innovative Applications of Artificial Intelligence, Edmonton, Alberta, Canada, July 30-31. AAAI Press: Palo Alto, CA. **(Best of IAAI)**
14. R. Hill, Y. Kim, M. van Lent. "Anticipating Where to Look: Predicting the Movements of Mobile Agents in Complex Terrain." Proceedings of the First International Joint Conference on Autonomous Agents and Multiagent Systems, Bologna, Italy, July, 2002.
15. R. Hill, C. Han, M. van Lent. "Perceptually Driven Cognitive Mapping of Urban Environments." Proceedings of the First International Joint Conference on Autonomous Agents and Multiagent Systems, Bologna, Italy, July, 2002.
16. W. Swartout, R. Hill, J. Gratch, W.L. Johnson, C. Kyriakakis, K. Labore, R. Lindheim, S. Marsella, D. Miraglia, B. Moore, J. Morie, J. Rickel, M Thieboux, L. Tuch, R. Whitney. Toward the Holodeck: Integrating Graphics, Sound, Character and Story. Proceedings of 5th International Conference on Autonomous Agents, Montreal, Canada, June 2001 **(FIPA Software Prototype Award at Agents 2001)**
17. R. Hill, J. Gratch, P. Rosenbloom. "Flexible Group Behavior: Virtual Commanders for Synthetic Battlespaces." Proceedings of the Fourth International Conference on Autonomous Agents, June 5-7, 2000, Barcelona, Spain.

18. W. Zhang and R. Hill. "A Template-Based and Pattern-Driven Approach to Situation Awareness and Assessment in Virtual Humans." Proceedings of the Fourth International Conference on Autonomous Agents, June 5-7, 2000, Barcelona, Spain.
19. R. Hill, J. Gratch, and P. Rosenbloom. "Flexible Group Behavior: Lessons Learned about Creating Autonomous Commanders," 9th Conference on Computer Generated Forces and Behavioral Representation, Orlando, FL, May 16-18, 2000.
20. Y. J. Kim, R. Hill, and J. Gratch. "How Long Can An Agent Look Away From A Target?" 9th Conference on Computer Generated Forces and Behavioral Representation, Orlando, FL, May 16-18, 2000.
21. W. Zhang and R. Hill. "Situation Awareness and Assessment: Issues and Computational Approaches." 9th Computer Generated Forces & Behavioral Representation, Orlando, Florida, May 16-18, 2000.
22. R. Hill. "Modeling Perceptual Attention in Virtual Humans." Proceedings of the 8th Conference on Computer Generated Forces and Behavioral Representation, Orlando, FL, May 1999. **(Best Paper Award)**
23. R. Hill. "Perceptual Grouping and Attention in a Multi-Agent World." Proceedings of the Third International Conference on Autonomous Agents, Seattle, WA, May 1999.
24. J. Gratch and R. Hill. "Continuous Planning and Collaboration for Command and Control in Joint Synthetic Battlespaces." Proceedings of the 8th Conference on Computer Generated Forces and Behavioral Representation, Orlando, FL, May 1999.
25. J. Gratch, S. Marsella, R. Hill, and George Stone. "Deriving Priority Intelligence Requirements for Synthetic Command Entities." Proceedings of the 8th Conference on Computer Generated Forces and Behavioral Representation, Orlando, FL, May 1999.
26. R. Hill, J. Chen, J. Gratch, P. Rosenbloom, M. Tambe. "Soar-RWA: Planning, Teamwork, and Intelligent Behavior for Synthetic Rotary Wing Aircraft." Proceedings of the 7th Conference on Computer Generated Forces & Behavioral Representation, May 12-14, 1998, Orlando, FL.
27. R. Hill, J. Chen, J. Gratch, P. Rosenbloom, M. Tambe. "Intelligent Agents for the Synthetic Battlefield: A Company of Rotary Wing Aircraft." Proceedings of Innovative Applications of Artificial Intelligence (IAAI-97), Providence, RI, July 1997.
28. S. Chien, A. Govindjee, T. Estlin, X. Wang, R. Hill. "Using Artificial Intelligence Planning Techniques to Automate Generation of Tracking Plans for a Network of Communications Antennas." Proceedings of the 1997 Conference on Innovative Application of Artificial Intelligence, Providence, RI, July 1997.

29. S. A. Chien, R. Hill, A. Govindjee, X. Wang, T. Estlin, M. A. Griesel, R. Lam, and K. V. Fayyad. "A Hierarchical Architecture for Resource Allocation, Plan Execution, and Revision for Operation of a Network of Communications Antennas." Proceedings of the 1997 IEEE International Conference on Robotics and Automation, Albuquerque, NM, April 1997, v,4, pp. 3340-3347.
30. S. A. Chien, A. Govindjee, T. Estlin, X. Wang, R. Hill. "Automated Generation of Tracking Plans for a Network of Communications Antennas." Proceedings of the 1997 IEEE Aerospace Conference, Aspen, CO, February, 1997, v. 1, pp. 343-359.
31. S. Chien, A. Govindjee, T. Estlin, X. Wang, R. Hill Jr., F. Fisher. "Using Artificial Intelligence Planning Techniques to Automate Generation of Tracking Plans for a Network of Communications Antennas," NASA Tech Brief, Vol. 21, No. 8, page 70, August 1997.
32. R. Hill, S. Chien, and K. Fayyad. "Automating operations for a network of communications antennas," IASTED International Conference on Artificial Intelligence, Expert Systems, and Neural Networks, Honolulu, Hawaii, August, 1996.
33. R. Hill, and W.L. Johnson. "Situating plan attribution for intelligent tutoring," Proceedings of the Twelfth National Conference on Artificial Intelligence, July 31-August 4, 1994, Seattle, WA.
34. R. Hill, K. Sturdevant, and W.L. Johnson. "Toward an embedded training tool for Deep Space Network Operations," Proceedings of AIAA Computing in Aerospace Conference, October 19-21, 1993, San Diego, CA.
35. R. Hill. Impasse-driven tutoring for reactive skill acquisition. Ph.D. dissertation, University of Southern California, 1993. Also appears as JPL Publication 94-9, April 1994.
36. R. Hill and W.L. Johnson. "Impasse-driven tutoring for reactive skill acquisition," Proceedings of the 1993 Conference on Intelligent Computer-Aided Training and Virtual Environment Technology (ICAT-VET-93), NASA/Johnson Space Center, Houston, Texas, May 5-7, 1993.
37. R. Hill and W.L. Johnson. "Designing an intelligent tutoring system based on a reactive model of skill acquisition," Proceedings of the World Conference on Artificial Intelligence in Education (AI-ED 93), Edinburgh, Scotland, 1993. **(Best Paper Finalist)**
38. R. Hill. "Integrating knowledge and control into hypermedia-based training environments: Experiments with HyperCLIPS," Proceedings of the SEPEC Conference on Hypermedia and Information Reconstruction '90: Aerospace Applications and Research Directions. Houston, Texas, Dec 3-5, 1990.

39. R. Hill and W.B. Pickering. "Intelligent tutoring with HyperCLIPS," Proceedings of the First CLIPS Users Conference. Houston: Johnson Space Center, 1990.
40. W.B. Pickering and R. Hill. "HyperCLIPS: A HyperCard interface to CLIPS," Proceedings of the First CLIPS Users Conference. Houston: Johnson Space Center, 1990.

### **BOOK CHAPTERS**

1. Swartout, W., Gratch, J., Hill, R., Hovy, E., Lindheim, R., Marsella, S., Rickel, J. and Traum, D. "Simulation meets Hollywood: Integrating Graphics, Sound, Story and Character for Immersive Simulation." Multimodal Intelligent Information Presentation, Oliviero Stock and Massimo Zancanaro Eds., Kluwer, 2005.
2. Rizzo, A.A., Pair, J., McNerney, P.J., Eastlund, E., Manson, B., Gratch, J., Hill, R., Roy, M. & Swartout, W. "Design and Development of a VR Therapy Application for Iraq War Veterans with PTSD." In J.D. Westwood et al. (Eds.), Technology and Informatics. 111. Amsterdam, NL: IOS Press. pp. 407-413, 2005.
3. S. Chien, R. Hill, X. Wang, T. Estlin, K.V. Fayyad, and H.B. Mortenson. "Why Real-world Planning is Difficult: A Tale of Two Applications." in New Directions in AI Planning, M. Ghallab and A. Milani, eds., IOS Press, Washington, D.C., 1996, pp. 287-298.
4. L. Gasser, N. Rouquette, R. Hill, J. Lieb. "Representing and using organizational knowledge in DAI systems," In L. Gasser and M.N. Huhns, editors, Distributed Artificial Intelligence, Volume II. London: Pitman and Morgan Kaufmann, 1989, 55-78.

### **GUEST EDITOR**

1. Hill, R. and Jacobstein, N., guest editors, Introduction to Special Issue featuring papers from 2004 Innovative Applications of Artificial Intelligence Conference (IAAI-04). AI Magazine, Volume Twenty-Six, Number Three, Fall 2005.
2. Riedl, J. and Hill, R., guest editors, Introduction to Special Issue featuring papers from 2003 Innovative Applications of Artificial Intelligence Conference (IAAI-03). AI Magazine, Volume Twenty-Five, Number Three, Fall 2004.
3. Hill, R. and Jacobstein, N., editors, Proceedings of the Sixteenth Innovative Applications of Artificial Intelligence Conference (IAAI-2004), July 27-29, 2004, San Jose, California, AAAI Press.
4. Riedl, J., and Hill, R., editors, Proceedings of the Fifteenth Innovative Applications of Artificial Intelligence Conference (IAAI-2003), Aug 12-14, 2003, Acapulco, Mexico, AAAI Press.

## **INVITED PAPERS, WORKSHOPS, AND SYMPOSIA**

1. Y. Kim, R. Hill. "Shifting of Focus of Perceptual Attention in Embodied Conversational Agents." Proceedings of the Workshop on Embodied Conversational Agents: Balanced Perception and Action (ECA), held in conjunction with The Third International Conference on Autonomous Agents and Multi Agent Systems, 19 – 23 July 2004.
2. J. Rickel, J. Gratch, R. Hill, S. Marsella, and W. Swartout. "Steve Goes to Bosnia: Towards a New Generation of Virtual Humans for Interactive Experiences." In AAI Spring Symposium on Artificial Intelligence and Interactive Entertainment, Stanford University, CA, March 20, 2001.
3. R. Hill. "Perceptual Attention in Virtual Humans: Towards Realistic and Believable Gaze Behaviors," Workshop on Achieving Human-Like Behavior in Interactive Animated Agents, in conjunction with The Fourth International Conference on Autonomous Agents, June 3, 2000, Barcelona, Spain.
4. R. Hill. "Perceptual Attention in Virtual Humans: Towards Realistic and Believable Gaze Behaviors," Proceedings of the AAI Fall Symposium 2000 on Simulating Human Agents, Cape Cod, MA, 2000.
5. R. Hill, "Soar: An Architecture for Human Behavior Representation," Invited Panel Member and Presentation at the Workshop on Human Behavioral Representation, Conference on Modeling and Simulation, American Institute for Aeronautics and Astronautics (AIAA), August 9-11, 1999, Portland, Oregon.
6. S. Chien, A. Govindjee, T. Estlin, X. Wang, F. Fisher, R. Hill Jr., "Using Artificial Intelligence Planning Techniques to Automate Generation of Tracking Plans for a Network of Communications Antennas," International Workshop on Planning and Scheduling for Space Exploration and Science, Oxnard, CA, October 1997.
7. S. Chien, R. Hill, A. Govindjee, X. Wang, T. Estlin, M. A. Griesel, R. Lam, and K. V. Fayyad, "Robust, Multi-layered Plan Execution and Revision for a Network of Communications Antennas," Proceedings of the 1996 AAI Fall Symposium on Plan Execution, Cambridge, MA, November 1996.
8. R. Hill, S. Chien, C. Smyth, K. Fayyad, P. Santos. "Planning for Deep Space Network Operations," Proceedings of the 1995 AAI Spring Symposium on Integrated Planning Applications, Stanford University, Palo Alto, CA, March 1995, pp. 51-56.
9. S. Chien, R. Hill, and K. Fayyad. "Why real-world planning is difficult." In Working Notes of AAI-94 Fall Symposium Series, Planning and Learning: On to Real Applications, November 4-6, 1994, New Orleans, LA.
10. R. Hill, K. Fayyad, P. Santos, K. Sturdevant. Knowledge acquisition and reactive planning for the Deep Space Network. In Working Notes of AAI-94 Fall

Symposium Series, Planning and Learning: On to Real Applications, November 4-6, 1994, New Orleans, LA., AAAI Press.

11. R. Hill and L. Cooper. Link Monitor and Control Operator Assistant: A case study in electronic performance support. Invited talk for the Government Help Desk and Training Conference, 8-11 June 1993, Washington, D.C.
12. R. Hill and L. Lee. Situation management in the Link Monitor and Control Operator Assistant. Proceedings of the Second International Symposium on Ground Data Systems for Space Mission Operations, SPACEOPS-92. Pasadena, CA, November 16-20, 1992.
13. L. Lee and R. Hill. Process control and recovery in the Link Monitor and Control Operator Assistant. Proceedings of the SOAR Symposium. Houston, Texas: NASA Johnson Space Center, 1992.
14. R. Hill. Embedded training as a factor in composite systems. Working Notes of the AAAI-91 Spring Symposium: Integrated Planning Applications, Stanford University, Palo Alto, CA, 1991.
15. R. Hill. The Knowledge Workbench: An AI rapid prototype testbed. Proceedings of the 1988 Tri-Service Data Fusion Symposium. Johns Hopkins University.

#### **UNPUBLISHED TECHNICAL REPORTS**

1. R. Hill. The student performance evaluation tool. JPL Technical Note. 26 September 1991.
2. R. Hill and B. Pickering. A knowledge-based approach to student performance evaluation. JPL Technical Note, 21 December 1990.
3. R. Hill and Les Gasser. Modeling the behavior of coordinated problem solvers. . USC Distributed Artificial Intelligence Group Research Note, 21 July 1989.
4. R. Hill. Prospective reasoning about liaisons between agents. USC Distributed Artificial Intelligence Group Research Note 22, 17 December 1986.

#### **RECENT INVITED TALKS**

- “Virtual Training for Complex Environments: A Case for Virtual Pediatric Victim Triage.” National Pediatric Disaster and Emergency Services Summit, September 11-12, 2008, Los Angeles, CA.
- “Using New Immersive Technologies, Training and Pedagogies to Foster Adaptive, Adult Critical Thinkers.” Learning & the Brain, April 26-29, 2008, Cambridge, MA.
- “Hollywood Meets Simulation: The Art and Science of Immersion for Learning.” Learning Strategies Consortium, 18 July 2008, Orlando, FL.

- Invited talk: “Institute for Creative Technologies.” Developing an Interdisciplinary Institute for Emerging Health Technologies, December 5-7, 2007, Honolulu, Hawaii.
- “Virtual Humans,” at the Second IEEE International Conference on Space Mission Challenges for Information Technology, July 28, 2006, Pasadena, CA.
- 7th Annual Knowledge Management Conference and 2006 E-Learning Solutions Seminar, April 19-21, 2006, Ronald Reagan Building and International Trade Center in Washington, DC.
- Keynote address at Canadian Advanced Simulation Technologies Symposium, 21-24 February 2006, CFB Gagetown, New Brunswick.

## **AWARDS**

- The Army Excellence In Leadership (AXL) project received the 2008 Research and Development Achievement Award for outstanding scientific and technological achievement from the Chief Scientist of the Army, Dr. Tom Killion.
- The Learning with Adaptive Simulation and Training (LAST) project received the 2008 Army Laboratory Collaboration Award. The partnership among the Army Research Laboratory Human Research and Engineering Directorate, Army Research Institute for the Social and Behavioral Sciences, Simulation Training Technology Center and ICT produced several high-impact research prototypes for training, including ELECT BiLAT and urbanSIM.
- Best of Conference on Innovative Applications of Artificial Intelligence in 2002 for paper entitled “Applying Perceptually Driven Cognitive Mapping to Virtual Urban Environments.” Article was subsequently featured in AI Magazine.
- Best Software Prototype Award at the Fifth International Conference on Autonomous Agents 2001, presented by the Foundation for Intelligent Physical Agents (FIPA), for the Mission Rehearsal Exercise.
- Mission Rehearsal Exercise system received the Defense Modeling and Simulation Organization (DMSO) / National Training Systems Association (NTSA) Modeling and Simulation award in 2001.
- Best Paper of Conference on Computer Generated Forces and Behavioral Representation 1999 for paper entitled “Modeling Perceptual Attention in Virtual Humans.”
- NASA Tech Brief Certificate of Recognition: Deep Space Network Planner
- NASA Tech Brief Certificate of Recognition: HyperCLIPS.
- Spiro B. Lekas Memorial Award for Greek Language Studies, Defense Language Institute, Monterey, California.

## **RESEARCH PROJECTS**

- **2006-2008:** Principle Investigator, Institute for Creative Technologies (ICT). The ICT is a University Affiliated Research Center at the University of Southern California for the United States Army with an annual budget of approximately \$25MM. Founded in 1999 and having completed its first five-year contract of \$45MM, a second contract for \$100 million was awarded in 2004 for an additional five years. In 2007, the contract was expanded to \$150 million for the five years. One of the key goals of the institute during the next phase of its life is to develop innovative applications and transition technology to the Army.

- **2004-2006:** Project leader, Learning with Adaptive Simulation and Training project (LAST), which produced two research prototypes: ELECT BiLAT and urbanSIM. The BiLAT provides the ability to practice bilateral negotiation in a cultural context. The system combines Virtual Human technology, intelligent tutoring and a story engine and runs on a commercial game platform on a laptop computer. BiLAT has been transitioned to the Army for deployment among all its soldiers. UrbanSIM is a city-level game for training leaders how to maintain stability in an urban setting. It combines a social simulation, story engine and intelligent tutoring to insure effective learning. UrbanSIM will be deployed in 2008 for user testing and feedback.
- **2002-2006:** Project Leader, Army Excellence in Leadership (AXL), which uses filmed stories and user-driven interviews with characters to provide a learning environment for Army leaders. AXL combined research on facial animation, lighting and artificial intelligence with traditional Hollywood film-making to create an issue-oriented dramatic presentation of a realistic Army scenario. Students learn by watching the filmed vignette, analyzing the situation under the guidance of a synthetic mentor, and interviewing characters from the scenario. An authoring toolkit was developed and has been adopted by the USC Marshall School of Business for teaching ethics to incoming MBA students. As of 2008, thousands of soldiers have used AXL and over 500 MBA students have used the MBA module.
- **2002-2006:** Co-leader, Joint Fires and Effects Training Simulation (JFETS). This is a mixed reality, immersive environment for teaching decision-making skills under stress to artillery soldiers. Over 7,000 soldiers have been trained with the prototype alone.
- **2000-2006:** Project leader, Perception and Spatial Cognition project, which performed research on modeling control of perceptual attention in virtual humans, as well as their ability to model the spatial environment they inhabited. Two Ph.D. students completed their doctoral degrees under this project.
- **1998-2000:** Principle Investigator, Flexible Group Behavior project, DARPA. Focused on generating coherent group behavior among synthetic helicopter pilots in large-scale simulations.
- **1998-2000:** Principle Investigator, Adaptive Synthetic Behavior, Office of Naval Research. Looked at the role of learning in perception and behavior among synthetic helicopter pilots in large-scale simulation.
- **1998-2000:** Principle Investigator, Emotional Synthetic Forces, Army Research Institute. Investigated models of emotion that could be used to modify the behavior of intelligent agents making decisions in virtual worlds.
- **1994-1995:** Principle Investigator, Network Automation, NASA. \$1.6 million research and development task for the NASA Deep Space Network (DSN) Advanced Technology Program. Tasks managed include DSN automated scheduling, automated and remote operations for the monitor and control system of an experimental deep space station, schedule-driven automation for monitor and control activities in the DSN, automated diagnosis of subsystem anomalies using statistical pattern recognition and machine learning techniques, RIDES simulation authoring toolkit with USC Behavioral Technologies Laboratory, DSN subsystem simulation, advanced ground system communication technology, and Distributed Computing Environment (DCE)-based communications services. Personal research focus:

development and integration of knowledge acquisition tool, Soar-based reactive planner, and RIDES-based simulator for monitor and control systems.

- **1993-1994:** Principle Investigator, monitor and control technology. Performed research and development for a reactive planner for a monitor and control system. Performed cognitive modeling, knowledge acquisition, and simulation to support the development of the reactive planner.
- **1992-1993:** Principle Investigator, intelligent tutor for NASA monitor and control system. Performed research and development on embedded, performance-oriented training for Deep Space Network operators. Developed an intelligent tutoring system called REACT in the Soar cognitive. REACT implements a theory of skill acquisition called impasse-driven tutoring, where the tutor intervenes when student reaches an impasse in problem solving during interactions with a simulator. REACT recognizes student impasses using a plan recognition technique called Situated Plan Attribution.
- **1991-1992:** Technical Lead, Link Monitor and Control Operator Assistant (LMCOA). Developed the Situation Manager to provide intelligent closed loop control for LMCOA, which is a plan execution and monitoring system. SM monitors the execution of the plans with respect to the state of the DSN devices, which are represented using a knowledge structure called a Temporal Dependency Network.
- **1991-1992.** Technical lead, Power Plant Tutor for NASA's Deep Space Network. Developed an intelligent tutoring system for training Deep Space Network power plant operators. Intelligent tutor dynamically adapted courseware based on a model of the student. Integrated LabView-based simulation of power plant control panels with the CLIPS-based intelligent tutor.
- **1988-1991:** Technical lead and developer, Training Navigation Tool (TNT). Developed the TNT for the U.S. Army's All Source Analysis System (ASAS). TNT provides a capability to design a learning objective hierarchy that can be linked to a hypermedia-based instructional environment. The student model is based on the learning objective hierarchy, and the instruction is adapted to the student based on performance on unit tests, navigating the student to the appropriate instruction in the hypermedia. Produced two tools: HyperCLIPS, an integration of HyperCard and the CLIPS expert system shell, and a CLIPS-based Training Navigation Tool (TNT).
- **1985-1988:** Technical leader and developer, Knowledge Workbench. Developed coordinated expert systems for tactical intelligence analysis. Adapted Time Warp operating system to provide communication and coordination among expert systems. Task performed for the U.S. Army Intelligence Center and School, Ft. Huachuca, Arizona.