James Matthew Rehg

Associate Professor
College of Computing
Georgia Institute of Technology
Atlanta, GA 30332-0280, USA

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EDUCATIONAL BACKGROUND

Degree	Year	University	Field
Ph.D.	1995	Carnegie Mellon University Pittsburgh, PA, USA	*Electrical and Computer Engineering*
M.S.	1988	Carnegie Mellon University Pittsburgh, PA, USA	*Engineering*
B.S.	1986	Virginia Polytechnic Institute, Blacksburg, VA, USA	*Electrical Engineering*

EMPLOYMENT HISTORY

Title	Organization	Years
Associate Professor	College of Computing Georgia Institute of Technology, Atlanta, GA	*2001-present*
Member of Technical Staff	Cambridge Research Laboratory Compaq Computer Corporation, Cambridge, MA	*1995-2001*
Project Leader Human Sensing	Cambridge Research Laboratory Compaq Computer Corporation, Cambridge, MA	*1996-2001*
Research Assistant	Robotics Institute Carnegie Mellon University, Pittsburgh, PA.	*1989-1995*
Research Intern	NEC Research Institute Princeton, NJ	*Summer 1991*

CURRENT FIELDS OF INTEREST

Computer Vision, Machine Learning, Computer Graphics, Human-computer Interaction, Distributed Computing

Goals:

My research focuses on detecting, modeling, and synthesizing human motion and behavior from video. I am interested in developing computer systems which can interact naturally with people in unstructured environments. I am interested in all aspects of this problem, ranging from learning algorithms for modeling human behavior to distributed system architectures for real-time performance.

I. TEACHING

A. Courses Taught

Quarter/Year	Course Number & Title	Number of Students	Comments
	College of Computing, Georgia Institute of Technology.		
Spring 2002	CS 7635 Computational Perception	31	New
Seminars			
Spring 2002	CS 8001CPL Computational Perception Seminar	25	New (co-taught)

B. Curriculum Development

CS 7635 Computational Perception (Spring 2002): A new graduate course in sensing and modeling people using video and audio. The formalism of graphical models is used to unify the treatment of a variety of statistical modeling techniques. Problems sets and a final project provide hands-on experience in face recognition, motion modeling, etc.

CS 8001F Computational Perception Seminar (Spring 2002): Co-organized with Prof. Frank Dellaert (CoC). Started a new seminar series to provide a weekly forum for researchers in vision, HCI, and graphics with interests in human sensing.

C. Individual Student Guidance

Ph.D. Students Supervised (in process as well as graduated)

Jay Summet (CoC, with Professor G. Abowd)
Fall 2001 - Present.
Current research on projected light displays.

M.S. Thesis Students supervised

Junko Tsumuji (LCC, with Professor Xinwei Sha)
Fall 2001 - present
Current research on space writing using motion capture.

II. RESEARCH AND CREATIVE SCHOLARSHIP

A. Thesis

M.S. Thesis

Title: *"Computer-Aided Synthesis of Routine Designs"*
Date Completed: *May 1988*
Advisors: *Prof. Sarosh Talukdar*
University: *Carnegie Mellon University*

Ph.D. Thesis

Title: *"Visual Analysis of High DOF Articulated Objects with Application to Hand Tracking"*
Date Completed: *May 1995*
Advisor: *Prof. Takeo Kanade*
University: *Carnegie Mellon University*

B. Journal Papers

B.0.1 M. J. Jones and J. M. Rehg. Statistical color models with application to skin detection. *International Journal of Computer Vision*, 46(1):81-96, Jan 2002.

B.0.2 J. M. Rehg, K. Knobe, U. Ramachandran, R. S. Nikhil, and A. Chauhan. Integrated task and data parallel support for dynamic applications. *Scientific Programming*, 7(3-4):289–302, 1999. Invited paper, selected from 1998 Workshop on Languages, Compilers, and Run-Time Systems.

B.0.3 I. J. Cox, J. M. Rehg, and S. Hingorami. A Bayesian multiple hypothesis approach to edge grouping and contour segmentation. *International Journal of Computer Vision*, 11(1):5-24, 1993.

C. Books and Parts of Books

C.1. Book Chapters

C.1.1 K. Waters, J. M. Rehg, M. Loughlin, S. B. Kang, and D. Terzopoulos. Visual sensing of humans for active public interfaces. In R. Cipolla and A. Pentland, editors, *Computer Vision for Human-Machine Interaction*, pages 83–96. Cambridge University Press, 1998.

C.1.2 J. Rehg, A. Elfes, S. Talukdar, R. Woodbury, M. Eisenberger, and R. H. Edahl. Design systems integration in CASE. In M. D. Rychener, editor, *Expert Systems For Engineering Design*, pages 279–301. Academic Press, Inc., 1988.

D. Edited Proceedings and Collections

D.0.1 Proceedings of IEEE Workshop on Models versus Exemplars in Computer Vision (Program Co-Chair), Kauai, Hawaii, USA. IEEE Computer Society. December, 2001.

D.0.2 Proceedings of IEEE Transactions on Pattern Analysis and Machine Intelligence, Special Issue on Graphical Models in Computer Vision, (Guest Editor), IEEE Computer Society. Expected printing July, 2003.

E. Conference and Workshop Publications

E.1. Invited Papers

E.1.1 J. M. Rehg. Motion capture from movies. In *Proceedings of Asian Conference on Computer Vision*, volume II, pages 1125–1131, Taipei, Taiwan, Jan 2000.

E.1.2 J. M. Rehg, S. B. Kang, and T.-J. Cham. Video editing using figure tracking and image-based rendering. In *International Conference on Image Processing*, Vancouver, B.C., Sept. 2000.

E.2. Refereed Conference Publications

E.2.1 D. DiFranco, T.-J. Cham, and J. M. Rehg. Reconstruction of 3-D Figure Motion from 2-D Correspondences. In *Proceedings of Conference on Computer Vision and Pattern Recognition*, Kauai, Hawaii, December 2001.

E.2.2 A. Garg, V. Pavlović, and J. M. Rehg. Audio-visual speaker detection using dynamic bayesian networks. In *Proceedings of Fourth International Conference on Automatic Face and Gesture Recognition*, pages 384–390, Grenoble, France, March 28-30 2000.

E.2.3 V. Pavlović, A. Garg, J. M. Rehg, and T. Huang. Multimodal speaker detection using error feedback dynamic bayesian networks. In *Proceedings of Conference on Computer Vision and Pattern Recognition*, volume 2, pages 34–41, Hilton Head, SC, June 13-15 2000.

E.2.4 V. Pavlović and J. M. Rehg. Impact of dynamic model learning on classification of human motion. In *Proceedings of Conference on Computer Vision and Pattern Recognition*, volume 1, pages 788–795, Hilton Head, SC, June 13-15 2000.

E.2.5 V. Pavlović, J. M. Rehg, and J. MacCormick. Learning switching linear models of human motion. In *Neural Information Processing Systems (NIPS)*, Denver, CO, November 2000.

E.2.6 T.-J. Cham and J. M. Rehg. Dynamic feature ordering for efficient registration. In *Proceedings of International Conference on Computer Vision*, volume 2, pages 1084–1091, Kerkyra, Greece, Sept. 20-27 1999.

E.2.7 T.-J. Cham and J. M. Rehg. A multiple hypothesis approach to figure tracking. In *Proceedings of Conference on Computer Vision and Pattern Recognition*, volume 2, pages 239–245, Ft. Collins, CO, June 1999.

E.2.8 V. Pavlović, J. M. Rehg, T.-J. Cham, and K. Murphy. A dynamic bayesian network approach to figure tracking using learned dynamic models. In *Proceedings of International Conference on Computer Vision*, volume 1, pages 94–101, Kerkyra, Greece, Sept. 20-27 1999.

E.2.9 M. J. Jones and J. M. Rehg. Statistical color models with application to skin detection. In *Proceedings of Conference on Computer Vision and Pattern Recognition*, volume 1, pages 274–280, Ft. Collins, CO, June 1999.

E.2.10 K. Knobe, J. M. Rehg, A. Chauhan, R. S. Nikhil, and U. Ramachandran. Scheduling constrained dynamic applications on clusters. In *Proc. SC99: High Performance Networking and Computing Conf*, Portland, OR, November 1999. Technical paper track.

E.2.11 U. Ramachandran, R. S. Nikhil, N. Harel, J. M. Rehg, and K. Knobe. Space-time memory: A parallel programming abstraction for interactive multimedia applications. In *Proceedings Seventh Symposium on Principles and Practice of Parallel Programming (PPoPP 99)*, pages 183–192, Atlanta, GA, May 4-6 1999. ACM SIGPLAN.

E.2.12 J. M. Rehg, K. P. Murphy, and P. W. Fieguth. Vision-based speaker detection using bayesian networks. In *Proceedings of Conference on Computer Vision and Pattern Recognition*, volume 2, pages 110–116, Ft. Collins, CO, June 1999.

E.2.13 D. D. Morris and J. M. Rehg. Singularity analysis for articulated object tracking. In *Proceedings of Conference on Computer Vision and Pattern Recognition*, pages 289–296, Santa Barbara, CA, June 23-25 1998.

E.2.14 J. M. Rehg, M. Loughlin, and K. Waters. Vision for a smart kiosk. In *Proceedings of Conference on Computer Vision and Pattern Recognition*, pages 690–696, San Juan, Puerto Rico, June 17-19 1997.

E.2.15 H. A. Rowley and J. M. Rehg. Analyzing articulated motion using expectation-maximization. In *Proceedings of Conference on Computer Vision and Pattern Recognition*, pages 935–941, San Juan, Puerto Rico, June 17-19 1997.

E.2.16 J. M. Rehg and T. Kanade. Model-based tracking of self-occluding articulated objects. In *Proceedings of International Conference on Computer Vision*, pages 612–617, Cambridge, MA, 1995.

E.2.17 J. M. Rehg and T. Kanade. Visual tracking of high dof articulated structures: An application to human hand tracking. In J.-O. Eklundh, editor, *Proceedings of European Conference on Computer Vision*, volume 2, pages II: 35–46, Stockholm, Sweden, 1994. Springer-Verlag.

E.2.18 I. J. Cox, J. M. Rehg, and S. Hingorami. A bayesian multiple hypothesis approach to contour segmentation. In G. Sandini, editor, *Proceedings of European Conference on Computer Vision*, pages 72–77, Santa Margherita Ligure, Italy, 1992. Springer-Verlag.

E.2.19 J. M. Rehg and A. P. Witkin. Visual tracking with deformation models. In *Proceedings of International Conference on Robotics and Automation*, pages 844–850, Sacramento, CA, April 1991.

E.2.20 J. Rehg, A. Elfes, S. Talukdar, et al. CASE: Computer-aided simultaneous engineering. In *Proc. of AI in Engineering Conf.*, Stanford, CA, Aug. 1988.

E.2.21 S. Talukdar, J. Rehg, and A. Elfes. Descriptive models for design projects. In *Proc. of AI in Engineering Conf.*, Stanford, CA, Aug. 1988.

E.3. Refereed Workshop Publications

E.3.1 U. Kremer, J. Hicks, and J. M. Rehg. Compiler-directed remote task execution for power management. In *Workshop on Compilers and Operating Systems for Low Power*, Philadelphia, PA, October 2000.

E.3.2 V. Pavlović, J. M. Rehg, and T.-J. Cham. A dynamic bayesian network approach to tracking using learned switching dynamic models. In N. Lynch and B. H. Krogh, editors, *Proceedings of Third International Workshop on Hybrid Systems: Computation and Control*, volume 1790 of *Lecture Notes in Computer Science*, pages 366–380, Pittsburgh, PA, March 23-25 2000. Springer.

E.3.3 R. S. Nikhil, U. Ramachandran, J. M. Rehg, K. Knobe, R. H. Halstead Jr., C. S. Joerg, and L. Kontothanassis. *Stampede*: A programming system for emerging scalable interactive multimedia applications. In *11th Intl. Workshop on Languages and Compilers for Parallel Computing*, Chapel Hill NC, August 7-9 1998.

E.3.4 J. M. Rehg, K. Knobe, U. Ramachandran, R. S. Nikhil, and A. Chauhan. Integrated task and data parallel support for dynamic applications. In D. O'Hallaron, editor, *Fourth Workshop on Languages, Compilers, and Run-Time Systems for Scalable Computers*, pages 167–180, Pittsburgh, PA, May 28–30 1998. Springer.

E.3.5 I. J. Cox, J. M. Rehg, S. L. Hingorani, and M. L. Miller. Grouping edges: An efficient bayesian multiple hypothesis approach. In I. J. Cox, P. Hansen, and B. Julesz, editors, *Partioning Data Sets*, number 19 in DIMACS series in Discrete Mathematics and Computer Science, pages 199–235. American Mathematical Society, 1995. Proceedings of DIMACS Workshop, April 19–21, 1993.

E.3.6 J. M. Rehg and T. Kanade. Digiteyes: Vision-based hand tracking for human-computer interaction. In J. K. Aggarwal and T. S. Huang, editors, *Proc. of Workshop on Motion of Non-Rigid and Articulated Objects*, pages 16–22, Austin, Texas, 1994.

E.4. Refereed Abstracts

E.4.1 J. M. Rehg. Audio-Visual Speaker Detection. In *Workshop on Multi-Sensory Perceptive Systems*, held in conjunction with Neural Information Processing Systems (NIPS 2001). Vancouver, BC, December 2001.

E.4.2 A. Garg, T. Choudhury, V. Pavlović, J. M. Rehg, and A. Pentland. Speaker detection using boosted dynamic bayesian network classifiers. In *Learning 2001*, Snowbird, UT, April 2001.

E.4.3 V. Pavlović and J. M. Rehg. Learning switching linear models of figure motion from image sequences. In *Learning 2000*, Snowbird, UT, April 2000.

F. Other

F.1. Technical Reports

F.1.1 D. E. DiFranco, T.-J. Cham, and J. M. Rehg. Recovery of 3d articulated motion from 2d correspondences. Technical Report 99/7, Compaq Computer Corporation, Cambridge Research Laboratory, December 1999.

F.1.2 J. M. Rehg, S. B. Kang, and T.-J. Cham. Video editing using figure tracking and image-based rendering. Technical Report 99/8, Compaq Computer Corporation, Cambridge Research Laboratory, December 1999.

F.1.3 T.-J. Cham and J. M. Rehg. A multiple hypothesis framework for figure tracking. Technical Report CRL 98/8, Compaq Computer Corporation, Cambridge Research Laboratory, Cambridge MA, July 1 1998.

F.1.4 R. S. Nikhil, U. Ramachandran, J. M. Rehg, K. Knobe, R. H. Halstead Jr., C. F. Joerg, and L. Kontothanassis. *Stampede*: A programming system for emerging scalable interactive multimedia applications. Technical Report CRL 98/1, Digital Equipment Corporation, Cambridge Research Laboratory, Cambridge MA, May 20 1998.

F.1.5 J. M. Rehg, K. Murphy, and P. Fiegut. A bayesian network approach to cue fusion in human sensing. Technical Report CRL 98/7, Digital Equipment Corporation, Cambridge Research Laboratory, Cambridge MA, July 1 1998.

F.1.6 J. M. Rehg, K. Knobe, U. Ramachandran, and R. S. Nikhil. Integrated task and data parallel support for dynamic applications. Technical Report CRL 98/3, Digital Equipment Corporation, Cambridge Research Laboratory, Cambridge MA, May 1998.

F.1.7 J. M. Rehg and D. D. Morris. Singularities in articulated object tracking with 2-D and 3-D models. Technical Report CRL 97/8, Digital Equipment Corporation, Cambridge Research Laboratory, Cambridge, MA, October 1997.

F.1.8 J. M. Rehg, U. Ramachandran, R. H. Halstead, Jr., C. Joerg, L. Kontothanassis, and R. S. Nikhil. Space-time memory: A parallel programming abstraction for dynamic vision applications. Technical Report CRL 97/2, Digital Equipment Corporation, Cambridge Research Laboratory, 1997.

F.1.9 K. Waters, J. M. Rehg, M. Loughlin, S. B. Kang, and D. Terzopoulos. Visual sensing of humans for active public interfaces. Technical Report CRL 96/5, Digital Equipment Corporation, Cambridge Research Laboratory, 1996.

F.1.10 J. M. Rehg and T. Kanade. Visual tracking of self-occluding articulated objects. Technical Report CMU-CS-TR-94-224, Carnegie Mellon University, School of Computer Science, 1994.

F.1.11 J. M. Rehg and T. Kanade. Digiteyes: Vision-based human hand tracking. Technical Report CMU-CS-TR-93-220, Carnegie Mellon University, School of Computer Science, 1993.

F.2. Issued Patents

F.2.1 T.-J. Cham and J. M. Rehg. Multiple mode probability density estimation with application to multiple hypothesis tracking. U. S. Patent 6,314,204. November 6, 2001.

F.2.2 J. M. Rehg and D. D. Morris. Method for tracking the motion of a 3-D figure. U.S. Patent 6,269,172. July 31, 2001.

F.2.3 S. B. Kang and J. M. Rehg. Multi-layer image-based rendering for video synthesis. U.S. Patent 6,266,068. July 24, 2001.

F.2.4 J. M. Rehg and D. D. Morris. Method and system for compressing a sequence of images including a moving figure. U.S. Patent 6,256,418. July 3, 2001.

F.2.5 K. Waters, M. Loughlin, J. M. Rehg, and S. B. Kang. Method and apparatus for visual sensing of humans for active public interfaces. U.S. Patent 6,256,046. July 3, 2001.

F.2.6 J. M. Rehg and D. D. Morris. Method for figure tracking using 2-D registration and 3-D reconstruction. U.S. Patent 6,243,106. June 5, 2001.

F.2.7 J. M. Rehg and D. D. Morris. Method for figure tracking using 2-D registration. U.S. Patent 6,240,198. May 29, 2001.

F.2.8 T.-J. Cham and J. M. Rehg. Multiple mode probability density estimation with application to sequential markovian decision processes. U.S. Patent 6,226,409. May 1, 2001.

F.2.9 U. Ramachandran, R. H. Halstead Jr., C. F. Joerg, L. Kontothanassis, R. S. Nikhil, and J. M. Rehg. Space-time Memory. U.S. Patent 6,067,604. May 23, 2000.

F.2.10 J. M. Rehg and H. A. Rowley. Method for the Detection of Human Body Motion in Frames of a Video Sequence. U.S. Patent 5,930,379. July 27, 1999.

G. Research Proposals and Grants (Principal Investigator)

G.1. Approved and Funded

1. **Stampede.NET - Networked Sensors and Displays for Distributed Telepresence**
   Sponsor: Microsoft Research, .NET program
   Investigator(s): U. Ramachandran and J. M. Rehg
   Amount: *$ 200,000 for 2 years*
   Submitted: October, 2001. Funded: December, 2001.

2. **Motion Capture from Movies: Video-Based Tracking and Modeling of Human Motion**
   Sponsor: National Science Foundation, CAREER Program
   Investigator(s): J. M. Rehg
   Amount: *$ 370,000 for 5 years ($ 16,000 matching from GT)*
   Submitted: July, 2001. Funded: November, 2001.

H. Research Honors and Awards

- National Science Foundation, CAREER Award, 2001.
- NASA Research Fellowship, 1990-1994.
- Carnegie Mellon University, General Electric Award, 1988-1990.

III. SERVICE

A. Professional Activities

A.1. Memberships and Activities in Professional Societies

- Associate Member, Institute of Electrical and Electronics Engineers (IEEE).
- Associate Member, Association for Computer Machinery.
- Member, Eta Kappa Nu, Tau Beta Pi.

A.2. Conference Committee Activities

1. Organizing Committee, *IEEE Workshop on Models versus Exemplars in Computer Vision*, Kauai, Hawaii, December 2001.
2. Program Committee, *IEEE International Conference on Computer Vision*, Vancouver, Canada, July 2001.
3. Program Committee, *Second IEEE Workshop on Statistical and Computational Theories of Vision*, Vancouver, Canada, July 2001.
4. Program Committee, *IEEE Workshop on Detection and Recognition of Events in Video*, Vancouver, Canada, July 2001.
5. Program Committee, *IEEE Workshop on Human Modeling, Analysis, and Synthesis*, Hilton Head Island, SC, June 2000.
6. Program Committee, *IEEE Conference on Computer Vision and Pattern Recognition*, Hilton Head Island, SC, June 2000.
7. Program Committee, *IEEE Workshop on Statistical and Computational Theories of Vision*, Fort Collins, CO, June 1999.
8. Program Committee, *Third International Conference on Automatic Face and Gesture Recognition*, Nara, Japan, April 1997.
9. Program Committee, *IEEE Workshop on Nonrigid and Articulated Motion*, San Juan, Puerto Rico, June 1997.
10. Invited Panelist, *NSF/DARPA Workshop on the Perception of Action*, Brewster, MA, May 1997.
11. Program Committee, *Second International Conference on Automatic Face and Gesture Recognition*, Killington, VT, October 1996.
12. Invited Panelist, *Third IEEE Workshop on Applications of Computer Vision*, Sarasota, FL, December 1996.

B. Member of Ph.D. Examining Committees

External

1. Sumit Basu, Massachusetts Institute of Technology, Dept. of Media Arts and Sciences, Since June, 2000.
   Thesis Title: Conversational Scene Analysis
   Principal Advisor: Professor A. Pentland
2. Ashit Talukder, Carnegie Mellon Univ., Dept. of Electrical and Computer Engineering, September 1999.
   Thesis Title: Nonlinear Feature Extraction for Computational Vision and Pattern Recognition
   Principal Advisor: Professor J. M. F. Moura

3. Jia-Ching Cheng, Carnegie Mellon Univ., Dept. of Electrical and Computer Engineering, October 1998.
   Thesis Title: Capture and Representation of Human Motion in Video
   Principal Advisor: Professor J. M. F. Moura

IV. NATIONAL AND INTERNATIONAL PROFESSIONAL RECOGNITION

A. Conference Session Chair

1. Conf. on Computer Vision and Pattern Recognition, Hilton Head Island, SC, 2000. Session on Visual Tracking.

B. Editorial and Reviewer Work for Technical Journals and Publishers

1. Reviewer for conferences: IEEE International Conference on Computer Vision, IEEE Computer Vision and Pattern Recognition Conference, IEEE International Conference of Face and Gesture Recognition, ACM SIGGRAPH.

2. Reviewer for journals: International Journal of Computer Vision, IEEE Transactions on Pattern Analysis and Machine Intelligence, Computer Vision and Image Understanding, IEEE Transactions on Multimedia, Journal of the Optical Society of America, IEEE Transactions on Robotics and Automation.

V. OTHER CONTRIBUTIONS

A. Invited Conference/Workshop Presentations

"Motion Capture from Movies"

Asian Conference on Computer Vision, Taipei, Taiwan, January 2000.

"Tracking, Learning, and Reconstructing Human Motion from Video"

Workshop on Real-Time Image Sequence Analysis, Oulu, Finland, August, 2000.

B. Invited Talks

"Speaker Detection Using Boosted Dynamic Bayesian Networks"

University of Washington, Dept. of Computer Science, June 2001.
NASA Jet Propulsion Laboratory, Machine Vision Colloquium, June 2001.
Brown University, Dept. of Computer Science, May 2001.

"Motion Capture from Movies"

University of Rochester, Dept. of Computer Science, March 2001.
Microsoft Research, Redmond, WA, September 2000.
Carnegie Mellon University, Dept. of Electrical and Computer Engineering, March 2000.
Stanford University, Broad Area Colloquium for Artificial Intelligence, Geometry, Graphics, Robotics, and Vision, February 2000.
Microsoft Beijing Research Center, January 2000.

"Figure Tracking"

MIT, 6.892: Computer Vision for Interface and Surveillance, November 2000.

"Tracking, Learning, and Reconstructing Human Motion from Video"

MIT, Dept. of Media Arts and Sciences, September 2000.
University of Toronto, Dept. of Computer Science, April 2000.
Hong Kong University of Science and Technology, Dept. of Computer Science, January 2000.

"Speaker Detection Using Dynamic Bayesian Networks"

University of California at Berkeley, Computer Science Department, February 2000.

"Tracking Articulated Objects"

Harvard University, CS 283: Computer Vision, December 1999.

"Learning Dynamic Models of Figure Motion"

Georgia Institute of Technology, Center for Graphics, Visualization, and Usability, October 1999.
Carnegie Mellon University, Robotics Institute, September 1999.

"Three New Results on the Visual Perception of Humans"

Carnegie Mellon University, Robotics Institute, November 1998.

"A Multiple Hypothesis Approach to Figure Tracking"

Carnegie Mellon University, Dept. of Electrical and Computer Engineering, November 1998.

"Industrial Research from DEC to Compaq"

Carnegie Mellon University, School of Computer Science Emmigration Course, November 1998.

"Space-Time Memory"

University of Massachusetts at Amherst, Dept. of Computer Science, October 1998.
University of Maryland, Dept. of Computer Science, October 1998.
Carnegie Mellon University, Robotics Institute, January 1998.

"The CRL Smart Kiosk Project"

Sanyo Electric Company, CS Research Unit, Osaka, Japan, April 1998.
Carnegie Mellon University, Robotics Institute, March 1997.

"Vision-Based Sensing for Active Public Interfaces"

Electro-Technical Laboratory, Computer Science Division, Tsukuba City, Japan, April 1998.
University of Osaka, Mechanical Engineering Department, April 1998.

"Singularities in Visual Tracking of Articulated Objects"

Boston University, Computer Science Department, September 1998.
Harvard University, Division of Engineering and Applied Sciences, August 1998.
University of Tokyo, Institute of Industrial Science, April 1998.

"Visual Tracking of Self-Occluding Articulated Motion"

University of Illinois at Urbana-Champaign, Beckman Institute, March 1997.

"DigitEyes: Vision-Based Human Hand Tracking"

INRIA Sophia-Antipolis, ROBOTVIS Group, May 1994.

California Institute of Technology, Dept. of Electrical Engineering, April 1994.
NASA Jet Propulsion Laboratory, Vision and Robotics Group, April 1994.
MIT, Dept. of Media Arts and Sciences, February 1994.
Digitial Equipment Corporation, Cambridge Research Laboratory, February 1994.

"A Bayesian Multiple Hypothesis Approach to Contour Segmentation"

Carnegie Mellon University, Robotics Institute, March 1992.
David Sarnoff Research Center, Computer Vision Group, September 1991.

"Visual Tracking With Deformation Models"

Digital Equipment Corporation, Cambridge Research Laboratory, September 1992.
University of Maryland, Center for Automation Research, March 1992.
Carnegie Mellon University, Robotics Institute, April 1990.

VI. PERSONAL DATA

Born:	18 September 1964, St. Louis, Missouri
Family Status:	Married with two children
Citizenship:	USA
Email:	`rehg@cc.gatech.edu`
WWW:	`http://www.cc.gatech.edu/~rehg`