Curriculum Vita
Ellen Catherine Hildreth

Department of Computer Science, Wellesley College
ehildreth@wellesley.edu 781-283-3025

Education

Massachusetts Institute of Technology
Doctor of Philosophy from the Department of Electrical Engineering and Computer Science, June, 1983. Thesis: *The Measurement of Visual Motion,* Advisor: Shimon Ullman

Master of Science from the Department of Electrical Engineering and Computer Science, February, 1980. Thesis: *Implementation of a Theory of Edge Detection,* Advisor: David Marr

Bachelor of Science from the Department of Mathematics, February, 1977

Professional Experience

Department of Computer Science, Wellesley College
September, 1991 – August, 2000: Associate Professor. September, 2000 – present: Full Professor
July, 1995 – May, 1998, July, 2011 – present: Department Chair

Center for Brains, Minds, and Machines, NSF Science and Technology Center based at MIT
September, 2013 – present: Co-Coordinator for Education

MIT Department of Brain and Cognitive Science
July, 1986 – June, 1990: Assistant Professor. July, 1990 – June, 1992: Associate Professor
July, 1992 – June, 1994: Visiting Professor

MIT Artificial Intelligence Laboratory
Summer, 1983 – Spring, 1986: Research Scientist

MIT Whitaker College of Health Sciences and Technology
November, 1983 – March, 1985: Associate Director of the Center for Biological Information Processing. March, 1985 – June, 1991: Co-Director

Awards and Fellowships

Fellow, American Association for Artificial Intelligence, Since 1994
Office of Naval Research Young Investigator Award, 1988
Presidential Young Investigator Award, National Science Foundation, 1987
Honorable Mention for the Association for Computing Machinery (ACM) Doctoral Dissertation Award, 1983
IBM Fellowship for graduate work at MIT, 1982-1983
Ida M. Green Fellowship for graduate work at MIT, 1977-1978

Editorial Boards

Member, Advisory Board, *Perception*, October, 1985 – January, 1998
Member, Editorial Board, *Computer Vision, Graphics and Image Processing*, January, 1987 – August, 2005
Member, The MIT Press Cognitive Science Editorial Board, July, 1987 – December, 1989

Consulting Editor, *Journal of Experimental Psychology: Human Perception and Performance*, October, 1987 – October, 1993, January, 2003 – October, 2004
Action Editor, *Neural Computation*, since March 1988
Associate Editor, *IEEE Transactions on Pattern Analysis and Machine Intelligence*, December, 1990 – January, 1993
Section Editor for the Computational Section, *Vision Research*, May, 1990 – June, 2004

Other Professional Service

Invited Participant, International Symposium on Physical and Biological Processing of Images, The Royal Society, London, 1982

Chairman, Technical session on Image Understanding, Annual Meeting of the Optical Society of America, San Diego, October, 1984

Organizer (with J. A. Movshon), Summer Course in Computational Neuroscience, Cold Spring Harbor Biological Laboratory, NY, 1985, 1987, 1989, 1992

Member, Program Committee, IEEE Workshop on Computer Vision, Michigan, October, 1985

Member, Program Committee, ACM Workshop on Motion: Representation and Analysis, South Carolina, May 1986

Invited Participant, International Symposium on Image and Understanding, The Royal Society, London, 1986

Technical Program Committee, Annual Meeting of the Optical Society of America, Rochester, NY, October 1987

National Science Foundation, Robotics and Machine Intelligence Program, Review Panels for Research Initiation Awards, CAREER Awards, and Presidential Young Investigator Awards, 1988, 1992-1999

Program Chairman (with R. Jain), IEEE Workshop on Visual Motion, March, 1989

Member, Program Committee, IEEE Conference on Vision and Pattern Recognition, June 1989

Symposium organizer, Annual Meeting of the Optical Society of America, October, 1989

Organizer (with V. Torre), ONR Workshop on Computational and Biological Models of Visual Processing, February, 1990

Invited Participant, CIBA Foundation/Royal Society of London Meeting on "Analyzing Optic Flow," The Royal Society, London, 1992

Invited Participant, National Science Foundation, Intelligent Manufacturing Research Planning Meeting, 1993

Member, Program Committee, IEEE Conference on Vision and Pattern Recognition, July 1994

National Science Foundation, Advisory Panel for Biosystems Analysis and Control, Division of Integrative Biology and Neuroscience, April 1995

Outside Evaluation Committee, Division of Life Sciences, Office of Naval Research, February 1995

Chair, Visiting Committee for the Department of Computer Science, Smith College, April 1997

American Association for Artificial Intelligence Fellows Selection Committee, 1999-2001

Invited Participant, Optical Flow and Beyond: A Boston Area Meeting, Boston University, May 2001

Program Committee, Special Track on AI Education, Florida Artificial Intelligence Research Society annual conferences, FLAIRS 2005, 2006, 2008-2011

Program Committee, International Conference on Computer Vision Theory and Applications, VISAPP 2006, 2007, 2008

Professional Memberships

Institute for Electronics and Electrical Engineers (1985-2012)
Association for Computing Machinery (1984-2004)
ACM Special Interest Group on Computer Science Education (2011-12)
American Association for Artificial Intelligence (1994-2012)
Association for Research in Vision and Ophthalmology (1986-2004)
Optical Society of America (1984-1999)
American Association for the Advancement of Science (1984-1999)

Book

The Measurement of Visual Motion, ACM Distinguished Dissertation Series, MIT Press, Cambridge, MA, 1984.

Publications

Marr, D. and Hildreth, E. C., "Theory of Edge Detection," *Proceedings of the Royal Society of London, Series B*, vol. 207, 1980, 187-217. Also appears in: *Digital Image Processing and Analysis: Volume 2: Digital Image Analysis*, edited by R. Chellappa and A. A. Sawchuk, IEEE Computer Society Press, New York, 8-38, 1985.

Marr, D., Poggio, T. and Hildreth, E. C., "Smallest Channel in Early Human Vision," *Journal of the Optical Society of America*, vol. 70, 868-870, 1980.

Hildreth, E. C., "Edge Detection in Man and Machine," *Robotics Age*, September/October, 8-14, 1981.

Hildreth, E. C., "The Integration of Motion Information Along Contours," Proceedings of the Workshop on Computer Vision: Representation and Control, Rindge, N.H., August, 83-91, 1982.

Hildreth, E. C., "Edge Detection for Computer Vision Systems," *Mechanical Engineering*, vol. 104, August, 48-53, 1982.

Hildreth, E. C., "Computing the Velocity Field Along Contours," Proceedings of the ACM Interdisciplinary Workshop on Motion: Representation and Perception, Toronto, Canada, April, 1983. Also appears in: *Motion: Representation and Perception*, edited by J. K. Tsotsos and N. I. Badler, North-Holland, New York, 121-127, 1986.

Hildreth, E. C., "The Detection of Intensity Changes by Computer and Biological Vision Systems," *Computer Vision, Graphics and Image Processing*, vol. 22, 1-27, 1983.

Ullman, S. and Hildreth, E. C., "The Measurement of Visual Motion," in: *Physical and Biological Processing of Images*, edited by O.J. Braddick and A.C. Sleigh, Springer-Verlag, Berlin, 1983.

Hildreth, E. C., "The Computation of the Velocity Field," *Proceedings of the Royal Society of London, Series B*, vol. 221, 189-220, 1984.

Hildreth, E. C., "Computations Underlying the Measurement of Visual Motion," *Artificial Intelligence*, vol. 23, 309-354, 1984.

Grimson, W. E. L. and Hildreth, E. C., "Comments on `Digital Step Edges from Zero Crossings of Second Directional Derivatives,'" *IEEE Transactions on Pattern Analysis and Machine Intelligence*, vol. PAMI-7, 121-127, 1985.

Hildreth, E. C. and Grzywacz, N. M., "The Incremental Rigidity Scheme for Recovering Structure from Motion: Position vs. Velocity Based Formulations," Proceedings of the ACM Workshop on Motion: Representation and Control, North Carolina, May, 1986.

Hildreth, E. C. and Hollerbach, J. M., "The Computational Approach to Vision and Motor Control," in: *Handbook of Physiology*, edited by F. Plum, American Physiological Society, 605-642, 1987.

Hildreth, E. C., "Edge Detection," in: *Encyclopedia of Artificial Intelligence,* edited by S. Shapiro, John Wiley & Sons, New York, 257-267, 1987.

Hildreth, E. C., "Optical Flow," in: *Encyclopedia of Artificial Intelligence,* edited by S. Shapiro, John Wiley & Sons, New York, 684-688, 1987.

Hildreth, E. C. and Koch, C., "The Analysis of Visual Motion: From Computational Theory to Neuronal Mechanisms," *Annual Review of Neuroscience*, vol. 10, 477-533, 1987.

Hildreth, E. C., "Computations Underlying the Measurement of Visual Motion," in: *Image Understanding 1985-86*, edited by W. Richards and S. Ullman, Ablex Publishing Co., New Jersey, 99-146, 1987.

Hildreth, E. C., "The Computational Study of Vision," in: *Advances in Physiological Research*, edited by H. McLennan, J. R. Ledsome, C. H. S. McIntosh and D. R. Jones, Plenum Press, New York, 203-231, 1987.

Grzywacz, N. M. and Hildreth, E. C., "The Incremental Rigidity Scheme for Recovering Structure from Motion: Position vs. Velocity Based Formulations," *Journal of the Optical Society of America A*, vol. 4, 503-518, 1987.

Grzywacz, N. M., Hildreth, E. C., Inada, V. and Adelson, E. H., "The Temporal Integration of 3--D Structure from Motion: A Computational and Psychophysical Study," in: *Organization of Neural Networks*, edited by W. von Seelen, G. Shaw and U. M. Leinhos, VCH, Weinheim, 239-259, 1988.

Hildreth, E. C., "Computational Studies of the Extraction of Visual Spatial Information from Binocular and Motion Cues," *Canadian Journal of Physiology and Pharmacology*, vol. 66, 464-477, 1988.

Hildreth, E. C. and Ullman, S., "The Computational Study of Vision," in: *Foundations of Cognitive Science*, edited by M. Posner, MIT Press/Bradford Books, 581-630, 1989.

Hildreth, E. C., "Computational Studies of Visual Motion Analysis," in: *Models of Visual Perception: From Natural to Artificial*, edited by M. Imbert, Oxford University Press, 1990.

Hildreth, E. C., "The Neural Computation of the Velocity Field," in: *Vision and the Brain: The Organization of the Central Visual System*, edited by B. Cohen, Raven Press, 139-164, 1990.

Hildreth, E. C., Grzywacz, N. M., Adelson, E. H., Inada, V. K., "The Perceptual Buildup of 3--D Structure from Motion," *Perception and Psychophysics*, vol. 48, 19-36, 1990.

Hildreth, E. C., "Motion Analysis for Visually-Guided Navigation," Proceedings of SPIE, Conference on Intelligent Robots and Computer Vision IX: Neural, Biological, and 3-D Methods, 1990.

Hildreth, E. C., "Edge Detection and Local Feature Extraction," in: *Encyclopedia of Artificial Intelligence, Second Edition*, edited by S. Shapiro, John Wiley & Sons, New York, 422-434, 1991.

Hildreth, E. C. and Grimson, W. E. L., "Commentary on Binocular Depth Perception," in: *From the Retina to the Neocortex: Selected Papers of David Marr,* edited by L. Vaina, Birkhauser Boston, 291-295, 1991.

Hildreth, E. C. and Torre, V., "Summary Report for the Workshop on Computational and Biological Models of Visual Processing," Office of Naval Research, European Scientific Notes, 1992.

Hildreth, E. C., "Recovering Heading for Visually-Guided Navigation," *Vision Research*, vol. 32, 1177-1192, 1992.

Hildreth, E. C., "Recovering Observer Heading from Visual Motion with Self-Moving Objects," *Philosophical Transactions of the Royal Society of London B*, vol. 337, 305-313, 1992.

Hildreth, E. C. and Royden, C. S. "Motion Perception" in Arbib, M. A. (Ed.) *The Handbook of Brain Theory and Neural Networks*. Cambridge: The MIT Press, 585-588, 1995.

Hildreth, E. C., Ando, H., Treue, S. and Andersen, R. A., "Recovering Three-Dimensional Structure from Motion with Surface Reconstruction," *Vision Research*, vol. 35, 117-137, 1995.

Treue, S., Andersen, R. A., Ando, H. and Hildreth, E. C., "Structure from Motion: Perceptual Evidence for Surface Interpolation," *Vision Research,* vol. 35, 139-148, 1995.

Hildreth, E. C. and Royden, C. S., "Recovering Heading in the Presence of Moving Objects," Proceedings of the International Workshop on Computational Vision and Parallel Processing, Islamabad, Pakistan, 111-120, 1995.

Royden, C. S. and Hildreth, E. C., "Human Heading Perception in the Presence of Moving Objects," *Perception and Psychophysics*, 58, 836-856, 1996.

Royden, C. S., Wolfe, J. M., Konstantinova, E. and Hildreth, E. C. "Visual Search by a Moving Observer: Locating a Static Object among Moving Distractors," Cognitive Science Society, Annual Meeting, 1997.

Hildreth, E. C. "Models of Recognition," Preface to the Special Issue on Models of Recognition, *Vision Research*, 38, 2225-2228, 1998.

Hildreth, E. C. and Royden, C. S., "Computing Observer Motion from Optical Flow," in: Watanabe, T. (Ed.), *High-level Motion Processing: Computational, Neurobiological and Psychophysical Perspectives,* Cambridge: MIT Press, 269-293, 1998.

Boer, E., Hildreth, E. C., and Goodrich, M. A. "Drivers in Pursuit of Perceptual and Virtual Targets," Proceedings of the Intelligent Vehicles '98 Conference, Stuttgart, Germany, October, 1998.

Boer, E. R., Hildreth, E. C. and Goodrich, M. A. "The Role of Mental Models in a Driver's Interaction with Traffic," 17th European Annual Conference on Manual Control, 1998.

Boer, E. R., Hildreth, E. C. and Goodrich, M. A. "A Driver Model of Attention Management and Task Scheduling: Satisficing Decision Making with Dynamic Mental Models," Proceedings of the 17th European Annual Conference on Human Decision Making and Manual Control, Valenciennes, France, December, 1998.

Boer, E. R. and Hildreth, E. C. "Modeling Drivers' Decision and Control Behavior on Country Roads," Proc. Eighth International Conference on Vision in Vehicles, Boston, August 1999.

Boer, E. R. and Hildreth, E. C. "A Theoretical model-based synthesis of drivers' curve negotiation behavior: One eye on the curve, the other on automation," Proc. 18th European Annual Conference on Human Decision Making and Manual Control, Loughborough University, October, 1999.

Royden, C. S. and Hildreth, E. C., "Differential Effects of Shared Attention on Perception of Heading and 3D Object Motion," *Perception and Psychophysics*, 61(1), 120-133, 1999.

Hildreth, E. C., Beusmans, J., Boer, E. R. and Royden, C. S., "From Vision to Action: Experiments and Models of Steering Control During Driving," *Journal of Experimental Psychology: Human Perception and Performance*, 26(3), 1106-1132, 2000.

Royden, C. S. & Hildreth, E. C. "Motion Perception: Navigation," in *The Handbook of Brain Theory and Neural Networks*, Second Edition, Michael A. Arbib, ed. Cambridge: The MIT Press, 676-679, 2003.

Hildreth, E. C. "Visual Motion Perception," in *Encyclopedia of Neuroscience*, *Third Edition,* Amsterdam: Elsevier, 2004.

Marr, D. and Hildreth, E. C., "Theory of Edge Detection," *Proceedings of the Royal Society of London, Series B*, vol. 207, 1980, 187-217. In: *Perception*, edited by T. Troscianko and A. Smith, SAGE Publications Ltd., New New Dehli, 2010.

Lee, S. & Hildreth, E. C., "An Introductory Computational Course for Science Students," *Journal of Computing Sciences in Colleges,* in press, 2010.

Hildreth, E. C. & Royden, C. S., "Integrating Multiple Cues to Depth Order at Object Boundaries," *Attention, Perception and Psychophysics,* vol. 73(7), 2011, 2218-2235.

Invited Talks

"A Theory of Edge Detection," Computer Science Colloquium, McGill University, October 1981.

"The Detection of Intensity Changes," American Society of Mechanical Engineers: Second International Computer Engineering Conference and Exhibit, August 1982.

"The Relevance of Neurophysiology to Artificial Intelligence," Artificial Intelligence Society of New England, Annual Meeting, October 1982.

"The Measurement of Visual Motion," Computer Science Colloquium, University of Pennsylvania, February 1983.

"The Measurement of Visual Motion," Psychology Department Seminar, New York University, March 1983.

"Measuring Visual Motion," Computer Science Department Seminar, Carnegie-Mellon University, March 1983.

"Computing the Velocity Field," Marr Conference, Cold Spring Harbor Biological Laboratory, NY, April 1983.

"The Measurement of Motion Along Contours," Psychology Department Seminar, Stanford University, May 1983.

"The Computation of the Velocity Field," Research Seminar, Stanford Research Institute, May 1983.

"The Measurement of Visual Motion," Psychology Colloquium, University of British Columbia, November 1983.

"Computing the Velocity Field," Computer Science Colloquium, State University of New York, Buffalo, December 1983.

"Computing the Visual Velocity Field," Ninth Annual Interdisciplinary Conference, Jackson, Wyoming, January 1984.

"Computations Underlying the Measurement of Visual Motion," Research Seminar, AT&T Bell Laboratories, Murray Hill, NJ, March 1984.

"Computation in Sensory Processing," keynote address at the Conference on Machines that Think, Sense and Act and Their Applications, sponsored by the Canadian Institute for Advanced Research and Science Council of Canada, Ottawa, Ontario, March 1984.

"The Analysis of Dynamic Images by Computer and Biological Vision Systems," Research Seminar, Harvard University, April 1984.

"The Computations that Underlie Early Visual Processing," Sloan Group Seminar, University of Pennsylvania, April 1984.

"The Measurement of Motion" and "Image Formation and Shape from Shading," NATO Advanced Study Institute, International School of Biophysics, Course on Vision and Image Understanding, Ettore Majorana Centre for Scientific Culture, Erice, Sicily, July 1984.

"Computing the Velocity Field," Annual Meeting of the Society for Mathematical Psychology, University of Chicago, August 1984.

"The Measurement of Visual Motion," Workshop on Computational Neuroscience, sponsored by the Sloan Foundation, Cold Spring Harbor Biological Laboratory, NY, September 1984.

"Computing the Velocity Field," Symposium on Image Understanding, Annual Meeting of the Optical Society of America, San Diego, October 1984.

"The Analysis of Visual Motion," Workshop on Computational Vision, Datalogisk Institute, University of Copenhagen, January 1985.

"The Computational Study of Human Vision," public address presented at Westchester University, April 1985.

"The Measurement of Visual Motion," keynote address presented at the Annual Meeting of the Washington, D. C. Chapter of the Association for Computing Machinery, May 1985.

"The Computational Study of Human Vision," Cognitive Science and Artificial Intelligence Lecture Series, Northwestern University, December 1985.

"The Recovery of Three-Dimensional Structure from Motion," Natural Information Processing Seminar, Harvard University, December 1985.

"The Incremental Recovery of 3-D Structure from Motion," Computer and Vision Research Center Seminar, University of Texas at Austin, March 1986.

"The Measurement of Visual Motion," Conference on 'Models of Visual Perception: From Natural to Artificial,' sponsored by the Fyssen Foundation, Paris, March 1986.

"Computational Models of Motion Analysis," Center for Visual Science 1986 Symposium, University of Rochester, June 1986.

"The Computational Study of Vision," Plenary Lecture presented at the XXX International Physiological Congress, Vancouver, B.C., July 1986.

"The Measurement of Motion," "The Recovery of 3-D Structure from Motion," and "Image Formation and Shape-from-Shading," College in Neurophysics: Organization of the Brain, International Centre for Theoretical Physics, Trieste, Italy, November 1986.

"The Computational Study of Human Vision," Cognitive Science and Machine Intelligence Laboratory, University of Michigan, February 1987.

"Computational Approaches to the Study of Brain Science," Harvard University Program in Neuroscience and Department of Neurobiology Annual Meeting, Cape Cod, MA, April 1987.

"The Computational Study of Human Vision," Annual Meeting of the Department of Defense Human Factors Engineering Technical Advisory Group, Boston, May 1987.

"The Computational Study of Visual Motion Analysis," Cognitive Science Seminar Series, University of California at Santa Barbara, May 1987.

"Theoretical Approaches to the Extraction of Visual Spatial Information from Binocular and Motion Cues," Ninth International Symposium on Spatial Representations and Sensorimotor Transformations, Montreal, May 1987.

"The Computational Study of Visual Motion Analysis," Association for Research in Nervous and Mental Disease Symposium on Vision and the Brain, New York, December 1987.

"Perceptual Tests of Computational Models," Meeting on Testing Computational Models with Behavioral Data, Office of Naval Research, Irvine, CA, January, 1988.

"The Computational Study of Human Visual Processing," Conference on Imaging in Medicine and Biology: Current Issues and Prospects, Drexel University, Philadelphia, September 1989.

"Computational Study of Human Vision," Seminar Series on Information Processing in the Visual System, Department of Neurobiology, Duke University, December 1989.

"The Recovery of Three-Dimensional Structure from Motion," Colloquium Series, Department of Psychology, Cornell University, January 1990.

"Recovering Observer Heading," Workshop on Computational and Biological Models of Visual Processing, Trieste, Italy, February 1990.

"Recovering Observer Motion for Navigation," SPIE Conference on Intelligent Robots and Computer Vision IXL Neural, Biological and 3-D Methods, Boston, November 1990.

"Recovering 3-D Heading for Visually-Guided Navigation," Computer Science Department Colloquium, Wellesley College, February 1991.

"Recovering Observer Motion from the Changing Visual Image," Computer Science Department Colloquium, Rensselaer Polytechnic Institute, February 1992.

"Recovering Observer heading from Visual Motion," Meeting on Natural and Artificial Low level Seeing Systems, The Royal Society of London, March 1993.

"Recovering Observer Heading from Visual Motion," Seminar Series on the Retina, Brain and Vision, The Rockefeller University, March 1993.

"Recovering Heading from Visual Motion," Conference on Binocular Stereopsis and Optical Flow, Toronto, June 1993.

"Judging Where We're Going from Visual Information," Faculty Seminar, Wellesley College, April 1994.

"Recovering Heading in the Presence of Moving Objects," Research Seminar, Nissan Cambridge Basic Research, September 1994.

"Recovering Heading in the Presence of Moving Objects," International Workshop on Computer Vision and Parallel Processing, Islamabad, Pakistan, January 1995.

"The Visual Guidance of Steering During Driving," Psychology Seminar, Brown University, March 1997.

"The Visual Control of Steering While Driving," Department of Brain and Cognitive Sciences Seminar, MIT, April 1997.

"The Visual Control of Driving," Computer Science Colloquium Series, NEC Research Institute, January 1998.

"The Visual Guidance of Steering While Driving," Seminar Series, Max Planck Institute for Biological Cybernetics, October 1999.

"From Vision to Action: Experiments and Models of Steering Control During Driving," Computer Science Colloquium, Purdue University, November 1999.

"Why Choose an Academic Career?" presented at a panel hosted by the MIT Graduate Student Council, Office of Career Services and Postdoctoral Advisory Council, 2007.

"Integrating Stereo and Motion Cues to the Analysis of Object Boundaries," Wellesley Systems Club, October 2009.

"Integrating Multiple Cues to Depth Order at Object Boundaries," Symposium on Computer Vision and Human Perception – Future Trends, The Weizmann Institute of Science, April 2012.

Research Grants at MIT:

"Computation of Stereo and Visual Motion: From Biophysics to Psychophysics," with T. Poggio and C. Koch, Office of Naval Research, SRO IV Program, Inferences from Images, 1985-1988.

"A Computer Laboratory for Computational Neuroscience," with T. Poggio, E. Bizzi, J. Hollerbach and C. Atkeson, MIT Project Athena and Sloan Foundation, 1986.

"Computation of Stereo, Motion and Color: From Biophysics to Psychophysics," with T. Poggio, C. Koch and N. Grzywacs, Department of Defense University Research Instrumentation Program, 1986.

"The Computation of Motion and Stereo: From Theory to Biophysics," with T. Poggio and N. Grzywacz, Sloan Foundation, $140,000, 1987-1989.

"Recovering Environmental Layout from Visual Motion," National Science Foundation, $312,000, 1987-1993 (transferred to Wellesley College in 1991).

"Recovering Environmental Layout from Visual Motion," McDonnell Foundation, matching funds for the NSF PYI award, $187,500, 1987-1992.

"Visual Integration and Recognition: From Computation to Psychophysics and Physiology," with T. Poggio and P. Schiller, Office of Naval Research, $935,706, 1988-1992.

"Motion Analysis in Biological and Computer Vision Systems," with T. Poggio and E. H. Adelson, National Science Foundation, $515,449, 1988-1991.

"Using Time-to-Collision to Recover 3-D Motion for Navigation and Manipulation," Office of Naval Research Young Investigator Award, $182,600, 1988-1992.

"The Recovery of Three-Dimensional Structure from Motion," with R. Anderson, Educational Foundation of America, $30,000, 1988-1989.

Research and Educational Grants at Wellesley College

"The Analysis of 3-D Motion for Visually-Guided Navigation," with C. Royden, National Science Foundation, RUI Program, $233,788, 1994-1998.

"Preparing Undergraduates for the Parallel Computing Future," with P. Metaxas, National Science Foundation, $32,511, 1994-1996.

"A Series of Workshops on Reshaping the Introductory Computer Science Curriculum," Committee on Educational Research and Development, $2,400, 1997.

"The Visual Guidance of Driving," Nissan Cambridge Basic Research, $12,000, 1997-1999.

Wellesley College Committees and Other Service

Science Center Student Summer Research Awards Committee, 1992, 1994, 1996, 2010, 2011
Participant, Wellesley College Science Planning Retreat, 1992
Committee on Curriculum and Instruction, 1992-94
Organizer, Seminars on Mathematics in the Sciences at Wellesley College, 1993
Academic Review Board, 1995-98, 2006-08
Chair, Computer Science Department, 1993-94, 1995-98, 2011-13
The Math Modeling and Problem Solving Working Group (related to the Quantitative Reasoning Working Group), 1995-97
First Year Advisor, 1997-98, 2001-02, 2009-10, 2011-12
Ad Hoc Committee on Calendar and Schedule, 1997-99
Agenda Committee, 1997-1999 (Chair, 1998-99)
Nominating Committee, Wellesley College Board of Trustees, 1998-2001
Committee on Faculty Awards, 2000-02
Computer Science Reappointments and Promotions Committee, 2000-present
Neuroscience Advisory Committee, 2000-present
Neuroscience Faculty Search Committees, 2001-02, 2005-06, 2007-08, 2009-10
Neuroscience Reappointments and Promotions Committee, 2003-present
Advisory Committee, Cognitive and Linguistic Sciences Program, 2000-present
Mellon Senior Faculty Development Committee, 2001-03
General Judiciary, 2002-03, 2004-06
Senior Exit Interview Project, 2003, 2005
Honor Code Council, 2009-12
Advisory Committee on Merit, 2011-13

MIT Student Theses Supervised

PhD
Department of Brain and Cognitive Sciences: Hiroshi Ando
Department of Physics: James Smith

MS
Department of Brain and Cognitive Sciences: Michael Drumheller, Lisa Mistler, Paul Wagner

BS
Department of Electrical Engineering and Computer Science: Tamara Abell, Eugene Zilberstein

Wellesley Honors Theses Supervised

Holly Yanco, Computer Science, Project: "The Use of Saliency in the Marr-Poggio-Grimson Stereo Algorithm," 1990-91

Lily Lee, Computer Science, Project: "An Iterative Algorithm for Observer Heading Detection," 1992-93

Brenda Krafft, Cognitive Science, "The Analysis of Stereo Algorithms," 1992-93

Elena Konstantinova, Computer Science and Cognitive Science, Project: "Information Used in Time-to-Collision Estimates by the Human Visual System," 1997-98

Allison Clayton, Computer Science, Project: “An Analysis of Time-to-Collision Methods in the Driving Context,” 2000-01

Brenda Peynado, Computer Science, Project: “Computational Stimulus Reconstruction in the Visual Field,” CS360 Spring 2005 (co-supervised with Mark Goldman)

Vasumathi Raman, Computer Science, Project: “Learning Primitive Predicates for Probabilistic Planning,” 2006-07 (co-supervised with Dr. Leslie Kaelbling at MIT)

Rosa-Lynne Fernando, Neuroscience and Computer Science, Project: “Catching Balls: What Visual Cues are Used to Judge the 3-D Trajectory of a Moving Object?” 2007-08

Carolyn Kim, Computer Science and Neuroscience, Project: “Differential Processing of Foreground vs. Background Objects in Human Stereo Processing,” 2012-13

Lila Fakharzadeh, Neuroscience, Project: “Visual Cues for the Perception of Animacy and its Time Course,” 2012-13 (co-supervised by Dr. Kami Koldewyn at MIT)