

## **TOMASO A. POGGIO**

Department of Brain & Cognitive Sciences  
McGovern Institute for Brain Research  
Computer Science & Artificial Intelligence Lab  
Massachusetts Institute of Technology  
43 Vassar Street  
Cambridge, MA 02142

URL: <http://cbcl.mit.edu/people/poggio/poggio-cv-web.htm>

Citizenship: U.S.

### **EDUCATION**

Ph.D. in Theoretical Physics, University of Genoa (1970), *Summa cum Laude*. Thesis: "On Holographic Models of Memory."

### **ACADEMIC POSITIONS**

Affiliated Faculty Member, Sloan Finance Group, Sloan School of Management, Massachusetts Institute of Technology, June 2014-present

Visiting Investigator, Institute for Infocomm Research, Agency for Science, Technology and Research (A\*STAR), May 2014-2018

Director, Center for Brains, Minds, and Machines (CBMM), McGovern Institute for Brain Research, Massachusetts Institute of Technology, September 2013-present.

Eugene McDermott Professor, Department of Brain & Cognitive Sciences, Computer Science & Artificial Intelligence Laboratory and McGovern Institute for Brain Research, Massachusetts Institute of Technology, 2002-present.

Associate Professor, Department of Psychology and Artificial Intelligence Laboratory, Massachusetts Institute of Technology, 1981-1984.

Wissenschaftlicher Assistant, Max Planck Institut für Biologische Kybernetik, Tübingen, Germany, 1971-1981.

### **HONORS AND SERVICE**

Swartz Prize for Theoretical and Computational Neuroscience, Society of Neuroscience, November 2014

Honorary Chair: European Conference on Computer Vision (ECCV), Florence, Italy, October 7-13, 2012

Valedictory Talk: "The Future of the Science and Engineering of Intelligence," IEEE CIFER 2012, New York City, March 30, 2012

Honorary Chair: IEEE Computational Intelligence for Financial Engineering and Economics (CIFER) 2012, March 29-30, 2012, New York City

Member of ISICT Committee of Experts, 2010

Member of the Duke University External Review Committee (Dept. CS), 2010

General Chair, 2010 International Conference on Brain Informatics (BI 2010), August 28-30, 2010, Toronto, Canada

American Association for the Advancement of Science (AAAS) Fellow (2009)

Okawa Prize, 2009

Keynote address at V incontro annuale ISICT, Genoa, Italy, October 2009

Honorary Member of IEEE Symposium on Computational Intelligence for Financial Engineering (CIFEr 2009)

Member of the Scientific Board of ISTA Vienna, 2008 – present

Member of the Scientific Board of ISI Turin, 2006 – present

Co-organizer of Workshop on Learning Theory, FOCM '05, Santander, Spain, 2005.

Neuroscience Research Program Honorary Associate

Elected to Committee for Istituto Superiore di Studi in Tecnologie dell'Informazione e della Comunicazione (ISICT), 2005-2006.

Gabor Award, International Neural Network Society, 2003.

Co-organizer of Workshop on Learning Theory, FOCM '02, Minneapolis, MN, 2002.

Eugene McDermott Chair, McGovern Institute for Brain Research, 2002.

Member of the Visiting Committee of the Computer Science Department, Columbia University, 2002.

Member of the Center for Neuromorphic System Engineering Advisory Board, California Technical Institute, 2002.

Chairman, Scientific Advisory Board of IRST (Istituto per la Ricerca Scientifica e Tecnologica, the main research institute in Trentino Alto Adige, Italy), June 2002.

Senior Investigator, McGovern Institute for Brain Research, 2000.

*Laurea Honoris Causa* in Ingegneria Informatica, Bicentenario dell'Invenzione della Pila Cerimonia di Chiusura dell'Anno Voltiano, Pavia, Italia, March 2000.

Member of the Riken External Review Committee (for BSI), 1999.

Member of External Advisory Committee evaluating the NEC Princeton Laboratory, 1996-1999.

Foreign Member, Istituto Lombardo dell'Accademia di Scienze e Lettere, 1998.

Foreign Member, Italian Academy of Sciences, 1998.

Honorable Mention, Pattern Recognition Society Award, October, 1998.

Honorary Chair, International ICSC/IFAC Symposium on Neural Computation/NC '98, Technical University of Vienna, September, 1998.

Fellow, American Academy of Arts and Sciences, 1997.

MIT 50K Entrepreneurship Competition Award, Imagen (advisor), 1997.

Member, Daimler-Benz Circle Member Group, 1997.

AT&T New Research Fund Award, 1996.

Member, Kuratorium of the Max Planck Society (for MPIfK, Tuebingen), 1995-1999.

Co-Chair, IEEE/IAFE “Computational Intelligence for Financial Engineering,” New York, April, 1995.

Co-Chair, School of Science Committee on “The Future of Neuroscience at MIT,” 1994.

Member, Biomedical Engineering Advisory Council, Johns Hopkins University, 1994-present.

Editorial Board, “Advances in Computational Mathematics”(AiCM), May 1993 – May 1999

Co-Director, Center for Biological and Computational Learning, Department of Brain & Cognitive Sciences, Massachusetts Institute of Technology, 1992-present.

Max Planck Research Award (with M. Fahle) from the Alexander von Humboldt Foundation, Bonn, Germany, 1992.

Co-organizer (with D.A. Glaser) of the Dahlem Workshop on “Exploring Brain Functions,” Berlin, 1991.

Founding Fellow, American Association of Artificial Intelligence, 1990.

Uncas and Helen Whitaker Chair, Department of Brain & Cognitive Sciences, Massachusetts Institute of Technology, 1988-2002.

Board of Trustees, The Neurosciences Institute, Neurosciences Research Foundation, 1988.

Corporate Fellow, Thinking Machines Corporation, 1984.

Director, the Center for Biological Information Processing, Whitaker College of Health Sciences and Technology, Massachusetts Institute of Technology, 1984.

Co-Director (with P H. Winston) of the Course on Vision and Image Understanding at Ettore Majorana Center for Scientific Culture, International School of Biophysics, Erice, Italy, 1984.

“Premio Luigi Carlo Rossi” award (with V. Torre) from Elsas Elettronica, San Giorgio, Italy, 1984.

Columbus Prize of the Istituto Internazionale delle Comunicazioni Genoa, at the XXX Convegno Internazionale delle Comunicazioni, Genoa, Italy, 1982.

Member, Neurosciences Research Program, 1979.

Otto-Hahn-Medaille (for outstanding young scientists) of the Max-Planck-Society, 1979.

CNR fellowship to work on problems of Neurobiology and Computer Science at the CNR Laboratory of Biophysics and Cybernetics, Camogli, Italy, CNR, 1971.

Angelo delle Riccia Graduate Fellowship, 1969 and 1970.

Award of the Cassa di Risparmio of Genoa, 1966.

## RECENT TALKS

Invited Participant: The Future of AI: Opportunities and Challenges San Juan, PR, The Future of Life Institute, January 2-4, 2015

Invited Speaker: Kavli Futures Symposium: Toward a Taxonomy of Cortical Computations, NYC, January 31-February 1, 2015

Invited Speaker: “Beyond the Turing Test,” 29<sup>th</sup> Annual AAAI Conference on Artificial Intelligence, Austin, Texas, January 25, 2015

Invited Speaker: Seeing/Sounding/Sensing, The MIT CAST Symposium, September 27, 2014

Co-Director: CBMM Summer School, MBL Woods Hole, MA, May 29 - June 12, 2014

Invited Speaker: "Opening Address," REVIVE (Reverse-engineering Visual Intelligence for Cognitive Enhancement) Workshop, Fusionopolis, Singapore, May 14, 2014

Invited Speaker: "Computational approaches to mind and brain," John Hopkins, May 8, 2014

Invited speaker: "The Computational Magic of the Ventral Stream: a Theory," Center for Theoretical Neuroscience, Columbia, April 10, 2014

Invited Speaker: "The Computational Magic of the Ventral Stream: Sketch of a theory (and why some deep architectures work)," Brown University, April 9, 2014

Invited Speaker: Siemens Distinguished Speakers Series, Siemens Corporate Research Labs, Princeton, April 2014 April 7, 2014

Invited Speaker: "A theory of Invariance," DeepMind, London, February 4, 2014

Invited Speaker: "The ventral stream: the computational level," Machine Learning from Cortical Networks (IARPA) Workshop, Washington, Feb 11, 2014

Organizer: "M-Theory," Deep Learning: Theory, Algorithms, Applications Seminar, Kanagawa, Japan, May 19-22, 2014

Invited Speaker: "Brains, minds and machines: the greatest problem in science," Rome Science Festival: Human Language and Machine Language, January 26, 2014

Invited Speaker: The Center for Brains, Minds and Machines" and "The magic theory," ASTAR visit, December 16-18, 2013

"Neural representation of action sequences: how far can a simple snippet-matching model take us," NIPS Poster, December 6, 2013

"M-theory," CBMM+IIT workshop @MIT: Learning Data Representation: Hierarchies and Invariance, November 23, 2013

Invited Speaker: MIT R&D Conference, "The Center for Brains, Minds, and Machines," Nov 13, 2013

Invited Speaker: "The Center for Brain, Minds, and Machines," ABF Workshop @MIT, November 6, 2013

"Introduction to CBMM and thrust 5 Overview," CBMM Opening Reception @MIT, October 25, 2013

Invited Speaker: "Object Recognition by Hierarchical Learning Machine," Max Planck Institute for Biological Cybernetics, Tübingen, Germany, October 13, 2013

Invited Speaker: "The computational magic of the ventral stream: sketch of a theory," UC Berkeley Math Department, August 29, 2013

Invited Speaker: "The computational magic of the ventral stream: sketch of a theory," Google, August 27, 2013

Invited Speaker: "The Center for Brains, Minds and Machines," Brains on Brains: MIT BCS, Cambridge, MA

Invited Speaker: "The computational magic of the ventral stream: sketch of a theory (and why some deep architectures work)," UC Berkeley Math Dept., August 29, 2013

Invited Speaker: "The computational magic of the ventral stream: sketch of a theory," Google, August 27, 2013

Invited Speaker: "The Center for Brains, Minds and Machines," Brains on Brains, MIT BCS Dept., Cambridge, MA

Invited Speaker: "The greatest problem in science," DARPA BASC Workshop, Washington, August 11, 2013

Invited Speaker: "The computational magic of the ventral stream: sketch of a theory (and why some deep architectures work)"Duke Workshop on Sensing and Analysis of High-Dimensional Data, July 25, 2013

Invited Speaker: "Learning representations for learning like humans do," IIT, Genoa, Italy, July 2013

Invited Speaker: "M-theory: the computational magic of visual cortex and why some deep learning architectures work," CRCNS (NSF) Workshop, Cambridge, MA, June 2013

Invited Speaker: "Object Recognition by Hierarchical Learning Machines," Max Planck Institute, Tuebingen, Germany, June 2013

Invited Speaker: A theory of the visual cortex," Innovation initiative, Cambridge, MA, May 2013

Invited Speaker: "Machine Learning and Computer Vision for Quantitative Mouse Phenotyping," Simons Workshop, MIT, Cambridge, MA, May 2013

Invited Speaker: "The MIT Center for Brains Minds and Machines: understanding objects and people by humans and machines" Workshop on Superhuman Intelligence, Seoul, South Korea, May 2013

Invited Speaker: "Artificial Intelligence," Introduction to Poggio workshop on Artificial Intelligence, MIT CSAIL, Cambridge, MA

Invited Speaker: "The computational magic of cortex: a theory," Workshop on Harmonic Analysis, Duke, Durham, NC

Invited Speaker: "The computational magic of cortex: a theory," NCSU, March 2013

Invited Speaker: "From behavior to neurons via theory," Janelia Conference: Insect Vision: Cells, Computation, and Behavior, March 4, 2013

Keynote Speaker: "The Computational Magic of Pattern Recognition in Cortex: A Theory of Selectivity and Invariance" ICPRAM 2013, Barcelona, Spain, Feb 17, 2013

Invited Speaker: "A theory of invariant recognition," Institute of Automation, Chinese Academy of Sciences, Beijing, China, November 2012

Keynote Speaker: "Invariant Recognition in Visual Cortex: a Theory" ACCV 2012, Seoul, Korea, November 7, 2012

Honorary Chair and Keynote Speaker: "The quest for a theory of Vision: from the level framework (revised) to the Invariance of the Ventral Stream", ECCV 2012, Florence, Italy, October 2012

Invited Speaker: "Computing Intelligence: Mind, Brain and Machine" Cracking the Neural Code: Third Annual Aspen Brain Forum, Aspen, CO, August 24, 2012

Invited: SciFoo, Sunnyvale, CA, August 3, 2012

Invited Speaker: EPSRC Symposium, Durham, England, July 13, 2012

Invited Speaker: "The magic of the visual cortex: Learning invariances", Dagshtul, Germany, June 24, 2012

Master Class: "Minds, Brains and Machines: Imagining the Future," The Fourth Israeli Presidential Conference: Facing Tomorrow 2012, Jerusalem, Israel, June 20, 2012

Invited Speaker: "The Computational Magic of the Ventral Stream," Computer Vision and Human Perception - Future Trends: In Honor of Prof. Shimon Ullman, The Weizmann Institute of Science, Israel, April 15, 2012

Invited Speaker: World Economic Forum Annual Meeting 2012, Davos, Switzerland, January 25-29, 2012

Organizer & Moderator: "Knowledge-Based Economies and Institutions Such As MIT," October 22, 2011, and "Science and Engineering of Intelligence," October 23, 2011, [9th Annual Festival della Scienza](#), Genoa, Italy

Invited Speaker: "The Computational Magic of the ventral stream: A theory", 2011 Annual Symposium: Open Questions in Neuroscience, Allen Institute for Brain Science, Seattle WA, October 4-5, 2011

Invited Speaker: World Conference on the Future of Science Mind: the essence of humanity, Venice, September 18-20, 2011

Invited Speaker: "Debate: Today the World of Tomorrow – Scientific Developments," Intelligence on the World, Europe, and Italy, Villa d'Este (on Lake Como, Italy), September 2, 2011

Invited Speaker: "From understanding vision in the fly to understanding visual cortex," ECVF 2011, Toulouse, France, August 26, 2011

Invited Speaker: "Learning Theory and Steve Smale," SmaleFest 2011, UC Berkeley, July 30-August 3, 2011

Invited Speaker: "The magic of the visual cortex," Dagstuhl Seminar: Mathematical and Computational Foundations of Learning Theory, July 17-23, 2011

Invited Speaker: "The computational magic off the ventral stream: towards a theory," IPAM, UCLA, Graduate Summer School: Probabilistic Models of Cognition, July 11, 2011

Plenary Speaker: "[The Hierarchical Recognition Architecture of Visual Cortex: Learning and Discounting Transformations](#)," The Fourth International Conference on Computational Harmonic Analysis, Hong Kong, May 23, 2011

Invited Speaker: Grand Challenges in Neural Computation II: Neuromimetic Processing and Synthetic Cognition, Los Alamos, NM, February 20-22, 2011

Invited Speaker: "Visual Recognition in the Primate Cortex," Harvard University, January 31, 2011

Invited Speaker: 'Max Birnstiel Lectures', Research Institute of Molecular Pathology (I.M.P.), Vienna, Austria, January 12, 2011

Invited Speaker: Defining Cognitive Informatics: "Learning and Intelligence in Brains and Machines," University Vienna, Austria, January 11, 2011

Invited Speaker: Jon Postel Distinguished Lecturer Series, "Intelligence in minds, brains and machines: the neuroscience perspective," UCLA, Computer Science Department, November 4, 2010

Invited Speaker: UC San Diego Neuroscience Seminar Series, "What is where: Visual Recognition and Attention in the Primate Cortex", November 2, 2010

Keynote address IEEE AIPR Conference, "Learning in Brains and Machines," Washington DC, October 13, 2010

Invited Speaker: BCE 2010, "Intelligence in Minds, Brains and Machines," Seoul, Korea, Sept 28-29, 2010.

Keynote address ECML 2010, "Hierarchical Learning Machines and Neuroscience of Visual Cortex" Barcelona, Spain, September 21, 2010

Invited Lecturer: ICVSS 2010, "Visual Recognition in Primates and Machines," Sicily, Italy, July 12, 2010

Invited Speaker: CONAS Workshop 2010, "Intelligence in minds, brains and machines," Ghent, Belgium, July 9-10, 2010

Invited Speaker: Luigi Stringa - memorial conference hosted by La Fondazione Bruno Kessler, Povo, Italy, July 5, 2010

Invited Speaker: Lagrange Prize Awarding Ceremony, Moderated conversation between James J. Collins and Tomaso Poggio, CRT Foundation, Turin, Italy July 1, 2010

Invited Speaker: SmaleFest, "What is Where: Vision and Learning", France, June 16, 2010

Invited Speaker: NSF Workshop on Shared Organizing Principles In the Computing and Biological Sciences, Arlington, VA, May 25-26, 2010

Keynote address: ATR Workshop, Memorial Symposium, "Intelligence and learning in Brains and Machines," Tokyo International Forum Hall, March 10, 2010

Invited speaker: Renaissance Technologies Colloquium, "Learning in Brains and Machines," Renaissance Corp., Stonybrook, NY, February 25, 2010

Invited speaker: New England Statistics Symposium, "Learning Theory: Kernels and Derived Kernels," Harvard University, Statistics Dept., April 17, 2010

Distinguished speaker, Heller Lecture Series in Computational Neuroscience, ["Intelligence and Learning in Brains and Machines"](#), The Hebrew University of Jerusalem, Israel, January, 2010

Invited speaker: "Learning Theory and Heierarchical Kernel Machines," INC Lecture, The Hebrew University of Jerusalem, Israel, January 7, 2010

Invited speaker: "What is where: Visual Reception I the Primate Cortex," Weizmann Institute, Jerusalem, Israel, January 6, 2010

William Benter Distinguished Lecturer, City University of Hong Kong, September 2009

Distinguished Visitor, A\*STAR program and the Biomedical Research Council, Singapore, September 2009

Keynote address at MMDS, Copenhagen "From Neuroscience to Hierarchical Learning Architectures," July 2009

Invited Speaker: Theory and Practice of Computational Learning Workshop, U. Chicago/TTI Chicago/Ohio State U., June 1-11, Chicago Illinois, 2009

Keynote address at ISMB Conference, Stockholm, "Computational Neuroscience: Models of the Visual System," July 2009

NSF Distinguished Lecture (CISE/BIO/SBE/MPS/ENG), April 24, 2009

Distinguished speaker Lincoln Lab, March 2009

Main Speaker at the Inauguration of the Werner Reichardt Center for Integrative Neuroscience, University of Tuebingen, December 8, 2008

Distinguished Speaker at NSF, Washington, August 14th, 2008

Distinguished Speaker at DARPA-IPTO, Washington, April 5<sup>th</sup>, 2008

["Models of Visual Recognition in the Ventral System"](#) (T. Poggio) Keynote address: Cosyne 2008, Salt Lake City, Utah, February 28, 2008.

["Visual Recognition in Primates and Machines"](#) (T. Poggio) Tutorial: Twenty-first Annual Conference Neural Information Processing Systems: NIPS Conference 2007, Vancouver, British Columbia, Canada, December 3, 2007.

## PROFESSIONAL ORGANIZATIONS

American Association for Artificial Intelligence, 1998.  
American Association for the Advancement of Science, 1983.  
American Mathematical Society, 1977.  
I.E.E.E., 1985. Membership number: 02390904.  
Institute for Scientific Interchange Foundation, 2004.  
I.U.P.A.B. Commission on Biophysics of Communication, 1982.  
Optical Society of America, 1977.  
Society for Neuroscience, 1984.

## EDITORIAL BOARDS

### Editorial Boards:

Advances in Applied Mathematics  
Advances in Computational Mathematics  
Advances in Neurocomputing  
Biological Cybernetics  
Computational Neuroscience Series of MIT Press  
Journal of Artificial Intelligence Research  
Network  
Neural Computation  
Neural Networks  
Neurocomputing  
Spatial Vision  
Synapse  
Visual Neuroscience  
PeerJ

### Associate Editor:

Journal of Computer and System Sciences, 1991.  
Systems & Control Letters, 1984.

### Advisory Boards:

National Laboratory of Pattern Recognition, 2015  
Handbook of the Senses, 2001.  
Neural Network Signal Processing Technical Committee, 1994.  
Institute of Physics Publishing, 1991.  
Annals of Mathematics and Artificial Intelligence, 1988.  
VNY Science Press, monographs in neuroinformatics and robotics, 1984.  
MIT/Bradford Press, Computational Models of Cognition and Perception, 1984.  
Lecture Notes in Biomathematics, 1979.  
Journal of Mathematical Biology, 1977.

### Review Boards:

Mathematical Reviews, 1977.



## PATENTS

### "Computer Method and Apparatus for Matching Between Line Drawings"

by Stephen E. Librande and Tomaso Poggio

M.I.T. Case No. 5831TS, United States of America Patent No. 5325475, Issued June 28, 1994

Japan Patent No. 3727061, Issued October 7, 2005

### "Computer Method and Apparatus for Video Conferencing"

#### "Memory-Based Method and Apparatus for Computer Graphics"

by R. Brunelli, Chiejn Cheng, Tomaso Poggio and Bin Zhang

M.I.T. Case No. 5572S, United States of America Patent No. 5416899, Issued May 16, 1995,

United States of America Patent No. 5659692, Issued August 19, 1997

European Patent Convention Patent No. 0621969, Issued July 3, 1996

France Patent No. 0621969, Issued July 3, 1996

Germany Patent No. 69303468.8, Issued July 3, 1996

United Kingdom Patent No. 0621969, Issued July 3, 1996

### "Object Movement Estimator Using One-Dimensional Optical Flow"

by Nicola Ancona, John N. Harris and Tomaso Poggio

M.I.T. Case No. 5951, United States of America Patent No. 5717792, Issued February 10, 1998

### "Example-Based Image Analysis and Synthesis Using Pixelwise Correspondence"

by David Beymer, Tomaso Poggio and Amnon Shashua

M.I.T. Case No. 6267S, United States of America Patent No. 5745668, Issued April 28, 1998

### "Image Analysis and Synthesis Networks Using Shape and Texture Information"

by David Beymer, Michael J. Jones, Tomaso Poggio and Thomas Vetter

M.I.T. Case No. 6779 United States of America Patent No. 5774129, Issued June 30, 1998

### "Method and Apparatus for Classifying and Identifying Images"

by W. Eric L. Grimson, Pamela Lipson, Tomaso Poggio and Pawan Sinha

M.I.T. Case No. 7274

United States of America Patent No. 5963670, Issued October 5, 1999

United States of America Patent No. 6549660, Issued April 15, 2003

### "Talking Facial Display Method and Apparatus"

by Antoine F. Ezzat and Tomaso Poggio

M.I.T. Case No. 8102, United States of America Patent No. 6250928, Issued June 26, 2001

### "Trainable System to Search for Objects in Images"

by Michael Oren, Constantine P. Papageorgiou, Tomaso Poggio and Pawan Sinha

M.I.T. Case No. 7691, United States of America Patent No. 6421463, Issued July 16, 2002

### "Correspondence between N-Dimensional Surfaces: Vector Fields That Are Defined By Surfaces and That Generate Surfaces Which Preserve Characteristics O"

by Tomaso Poggio and Christian R. Shelton

M.I.T. Case No. 8101, United States of America Patent No. 6525744, Issued February 25, 2003

### "Trainable Videorealistic Speech Animation"

by Antoine F. Ezzat and Tomaso Poggio

M.I.T. Case No. 9838, United States of America Patent No. 7168953, Issued January 30, 2007

### "Electronic Market-Maker"

by Nicholas Tung. Chan, Andrew W. Lo and Tomaso Poggio

M.I.T. Case No. 8336S, United States of America Patent No. 7,599,876, Issued October 6, 2009

"High-Performance Vision System Exploiting Key Features Of Visual Cortex"  
by Stanley M. Bileschi, Tomaso Poggio, Maximilian Riesenhuber, Thomas R. Serre and Lior Wolf  
M.I.T. Case No. 11985, United States of America Patent No. 7,606,777, Issued October 20, 2009

"Voice Morphing For Text-To-Speech"  
by Antoine F. Ezzat and Tomaso Poggio  
M.I.T. Case No. 8883

"Face Detection and Identification: The Espresso System"  
by Bernd Heisele, Purdy Ho and Tomaso Poggio  
M.I.T. Case No. 9577

"Localized Spectro-Temporal Cepstral Analysis of Speech"  
by Jacob Vincent. Bouvrie, Antoine F. Ezzat and Tomaso Poggio  
M.I.T. Case No. 12832

#### CURRENT GRADUATE STUDENTS:

Charlie Frogner	Brain & Cognitive Sciences
Yena Han	Electrical Engineering & Computer Science
Leyla Isik	Computational and Systems Biology
Owen Lewis	Brain & Cognitive Sciences
James Mutch	Brain & Cognitive Sciences
Andrea Tachetti	Electrical Engineering & Computer Science
Stephen Voinea	Brain & Cognitive Sciences
Chiyuan Zhang	Electrical Engineering & Computer Science

#### CURRENT POSTDOCTORAL FELLOWS/ASSOCIATES:

Fabio Anselmi, (*LCSL, IIT*), 2001-present  
Gemma Roig, 2014-present  
Georgios Evangelopoulos, (*LCSL, IIT*), 2013-present  
Maximilian Nickel, (*LCSL, IIT*), 2013-present

#### FORMER GRADUATE STUDENTS:

Youssef Mroueh, PhD, December 2014, Thesis Title: "From Bits to Information: Learning meets Compressive Sensing," Massachusetts Institute of Technology, Electrical Engineering and Computer Science.

Joel Z. Leibo, PhD, September 2013, Thesis Title: "The Invariance Hypothesis and the Ventral Stream," Massachusetts Institute of Technology, Brain and Cognitive Sciences

Cheston Tan, PhD, April 2012. Thesis Title: [Towards a Unified Account of Face \(and Maybe Object\) Processing](#), Massachusetts Institute of Technology, Electrical Engineering & Computer Science

[Huei-han Jhuang](#), PhD, June 2011. Thesis Title: [Dorsal Stream: From Algorithm To Neuroscience](#), Massachusetts Institute of Technology, Electrical Engineering & Computer Science

[Ethan Meyers](#), PhD, February 2011, Thesis Title: [Using neural population decoding to understand high level visual processing](#), Massachusetts Institute of Technology, Brain and Cognitive Sciences

[Ulf Knoblich](#), PhD, December 2010, *also with Chris Moore*, Thesis Title: Examination of the Role of Specific Interneuron Types on Temporal Properties of Neocortical Processing, Massachusetts Institute of Technology, Brain and Cognitive Sciences

[Sharat Chikkerur](#), Ph.D., June 2010, Thesis Title: "What and Where: A Bayesian Inference Theory of Visual Attention," Massachusetts Institute of Technology, Electrical Engineering & Computer Science.

[Jake Bouvrie](#), Ph.D., June 2009, Thesis Title: [Hierarchical Learning: Theory with Applications in Speech and Vision](#), Massachusetts Institute of Technology, Brain & Cognitive Sciences

Giorgos Zacharia, Ph.D., February 2009. Thesis Title: [Regularized Algorithms for Ranking, and Manifold](#), Massachusetts Institute of Technology, Electrical Engineering & Computer Science

Adlar Kim, Ph.D., May 2008, Thesis Title: An Order Flow Model and a Liquidity Measure of Financial Markets, Massachusetts Institute of Technology, Electrical Engineering & Computer Science.

Minjoon Kouh, Ph.D., May 2007. Thesis Title: [Toward a More Biologically Plausible Model of Object Recognition](#), Massachusetts Institute of Technology, Physics.

[Stanley Bileschi](#), Ph.D., May 2006. Thesis Title: [StreetScenes: Towards Scene Understanding in Still Images](#), Massachusetts Institute of Technology, Electrical Engineering & Computer Science.

[Sanmay Das](#), Ph.D., April 2006. Thesis Title: [Dealers, Insiders and Bandits: Learning and Its Effects on Market Outcomes](#), Massachusetts Institute of Technology, Electrical Engineering & Computer Science.

[Alexander Rakhlin](#), Ph.D., April 2006. Thesis Title: [Applications of Empirical Processes in Learning Theory: Algorithmic Stability and Generalization Bounds](#), Massachusetts Institute of Technology, Brain & Cognitive Sciences.

[Thomas Serre](#), Ph.D., March 2006. Thesis Title: [Learning a Dictionary of Shape-Components in Visual Cortex: Comparison with Neurons, Humans and Machines](#), Massachusetts Institute of Technology, Brain & Cognitive Sciences

[Gene W. Yeo](#), Ph.D., November 2004. Thesis title: [Identification, Improved Modeling and Integration of Signals to Predict Constitutive and Alternative Splicing](#), Massachusetts Institute of Technology, Electrical Engineering & Computer Science.

[Ryan Rifkin](#), Ph.D., September, 2002. Thesis title: [Everything Old Is New Again: A Fresh Look at Historical Approaches in Machine Learning](#), Massachusetts Institute of Technology, Electrical Engineering & Computer Science and Operations Research.

[Martin Szummer](#), PH.D., September 2002. Thesis title: [Learning from Partially Labeled Data](#), Massachusetts Institute of Technology, Electrical Engineering & Computer Science.

[Vinay Kumar](#), Ph.D., June 2002. Thesis title: [Towards Trainable Man-machine Interfaces: Combining Top-down Constraints with Bottom-up Learning in Facial Analysis](#), Massachusetts Institute of Technology, Brain & Cognitive Sciences.

[Tony Ezzat](#), Ph.D., June 2002. Thesis title: [Trainable Vidoerealistic Speech Animation](#), Massachusetts Institute of Technology, Electrical Engineering & Computer Science.

[Christian Shelton](#), Ph.D., August 2001. Thesis title: [Importance Sampling for Reinforcement Learning with Multiple Objectives](#), Massachusetts Institute of Technology, Electrical Engineering & Computer Science.

[Sayan Mukherjee](#), Ph.D., June 2001. Thesis title: [Application of Statistical Learning Theory to DNA Microarray Analysis](#), Massachusetts Institute of Technology, Brain & Cognitive Sciences.

Nicholas Chan, Ph.D. February 2001. Thesis title: [Artificial Markets and Intelligent Agents](#), Massachusetts Institute of Technology, Electrical Engineering & Computer Science.

[Theodoros Evgeniou](#), Ph.D. June 2000. Thesis title: [Learning with Kernel Machine Architectures](#), Massachusetts Institute of Technology, Electrical Engineering & Computer Science.

[Maximilian Riesenhuber](#), Ph.D. June 2000. Thesis title: [How a Part of the Brain Might or Might Not work: A New Hierarchical Model of Object Recognition](#), Massachusetts Institute of Technology, Brain & Cognitive Sciences.

[Constantine Papageorgiou](#), Ph.D., December 1999. Thesis title: [A Trainable System for Object Detection in Images and Video Sequences](#), Massachusetts Institute of Technology, Electrical Engineering & Computer Science and Operations Research.

Edgar Osuna, Ph.D. June 1998. Thesis title: [Support Vector Machines: Training and Applications](#), Massachusetts Institute of Technology, Electrical Engineering & Computer Science and Operations Research.

[Michael Jones](#), Ph.D. June 1997. Thesis title: "Multidimensional Morphable Models: A Framework for Representing and Matching Object Classes," Massachusetts Institute of Technology, Electrical Engineering & Computer Science.

Robert Thau, Ph.D. June 1997. Thesis title: [Reliably Mapping a Robot's Environment Using Fast Vision and Local, but not Global, Metric Data](#), Massachusetts Institute of Technology, Brain & Cognitive Sciences.

Emanuela Bricolo, Ph.D., June 1996. Thesis title: [On the Representation of Novel Objects: Human Psychophysics, Monkey Physiology and Computational Models](#), Massachusetts Institute of Technology, Brain & Cognitive Sciences.

Kah-Kay Sung (*deceased*), Ph.D., February 1996. Thesis title: [Learning and Example Selection for Object and Pattern Detection](#), Massachusetts Institute of Technology, Electrical Engineering & Computer Science.

[Pawan Sinha](#), Ph.D., August 1995. Thesis title: [Perceiving and Recognizing Three-Dimensional Forms](#), Massachusetts Institute of Technology, Electrical Engineering & Computer Science.

[David Beymer](#), Ph.D., August 1995. Thesis title: [Pose-invariant Face Recognition Using Real and Virtual Views](#), Massachusetts Institute of Technology, Department of Electrical Engineering & Computer Science.

[Partha Niyogi](#), Ph.D., February 1995. Thesis title: [The Informational Complexity of Learning from Examples](#), Massachusetts Institute of Technology, Electrical Engineering & Computer Science

James Hutchinson, Ph.D., February 1994; S.M., June 1986. Ph.D. Thesis title: [A Radial Basis Function Approach to Financial Time Series Analysis](#), Massachusetts Institute of Technology, Department of Electrical Engineering & Computer Science. S.M. Thesis title: "Early Vision Problem Solving with Analog and Binary Resistive Networks," Massachusetts Institute of Technology, Department of Electrical Engineering & Computer Science.

[Brian Subirana](#), Ph.D., February 1994. Thesis title: "Mid-level Vision and Recognition of Non-Rigid Objects," Massachusetts Institute of Technology, Department of Electrical Engineering & Computer Science.

Anthony Passera, Ph.D., February 1993. Thesis title: [A Computational Model of Visuo-motor Development](#), Massachusetts Institute of Technology, Department of Brain & Cognitive Sciences

[Thomas Breuel](#), Ph.D., June 1992. Thesis title: [Geometric Aspects of Visual Object Recognition](#), Massachusetts Institute of Technology, Department of Brain & Cognitive Sciences.

[Lyle Borg-Graham](#), Ph.D., January 1992. Thesis title: [On Directional Selectivity in Vertebrate Retina: An Experimental and Computational Study](#), Massachusetts Institute of Technology, Harvard-MIT Division of Health Sciences and Technology.

[Woodward Yang](#), Ph.D., September 1990. Thesis title: [The Architecture and Design of CCD Processors for Computer Vision](#), Massachusetts Institute of Technology, Department of Electrical Engineering & Computer Science.

Ed Gamble, Ph.D., June 1990. Thesis title: "Integration of Early Visual Cues for Recognition," Massachusetts Institute of Technology, Department of Electrical Engineering & Computer Science.

Michael Villalba, Ph.D., January 1990. Thesis title: "Fast Visual Recognition of Large Object Sets," Massachusetts Institute of Technology, Department of Aeronautics & Astronautics.

[Davi Geiger](#), Ph.D., December 1989. Thesis title: "Visual Models with Statistical Field Theory," Massachusetts Institute of Technology, Department of Mathematics.

[Anya Hurlbert](#), M.D./Ph.D., May 1989. Thesis title: "The Computation of Color," Harvard Medical School/Massachusetts Institute of Technology, Department of Brain & Cognitive Sciences.

Bror Saxberg, M.D./Ph.D., May 1989; S.M., May 1985. Ph.D. Thesis title: "A Modern Differential Geometric Approach to Shape from Shading," Massachusetts Institute of Technology, Department of Electrical Engineering & Computer Science. S.M. Thesis title: "Parameters of a Three-Dimensional Free Fall Trajectory from its Two-Dimensional Central Projection," Massachusetts Institute of Technology, Department of Electrical Engineering & Computer Science.

Jose Marroquin, Ph.D., September 1985. Thesis title: "[Probabilistic Solution of Inverse Problems](#)," Massachusetts Institute of Technology, Department of Electrical Engineering & Computer Science.

[Christof Koch](#), Ph.D., October 1982. Thesis title: "Nichtlineare Informationsverarbeitung in Dendritischen Baumen Belicbiger Geometrie," University of Tübingen, Germany.

#### FORMER MASTERS STUDENTS:

[Ami Patel](#), M.Eng., August 2013, Thesis Title: "Effects of Neuronal Correlations on Population Decoding and Encoding Models," Massachusetts Institute of Technology, Department of Electrical Engineering & Computer Science.

Chun-Kai Wang, M.Eng., June 2013, Thesis Title: "Multiple Mice Tracking Using Microsoft Kinect," Massachusetts Institute of Technology, Department of Electrical Engineering & Computer Science.

Yuzhao (Allen) Ni, M.Eng., June 2013, Thesis Title: "[Mouse Behavior Recognition with The Wisdom of Crowd](#)", Massachusetts Institute of Technology, Computation for Design and Optimization.

Stav Braun, M.Eng, June 2012, Thesis title: "Tracking Multiple Mice," Massachusetts Institute of Technology, Department of Electrical Engineering & Computer Science.

Nicholas Edelman, M.Eng., July 2011, Massachusetts Institute of Technology, Department of Electrical Engineering & Computer Science.

Hristo Paskov, M.Eng., July 2010, Massachusetts Institute of Technology, Department of Electrical Engineering & Computer Science.

Andre Wibisono, M.Eng., June 2010, Massachusetts Institute of Technology, Department of Electrical Engineering & Computer Science.

Neha Soni, S.M., EECS, MIT, February 2006. "Sequence Motifs Predictive of Tissue-specific Skipping."

James Skelley, S.M., August 2005. Thesis title: "Experiments in Expression Recognition" Massachusetts Institute of Technology, Department of Electrical Engineering & Computer Science

Charles F. Cadieu, S.M., May 2005. Thesis title: "Modeling Shape Representation in Visual Cortex Area V4," Massachusetts Institute of Technology, Department of Electrical Engineering & Computer Science.

Ian S. Martin, S.M., May 2005. Thesis title: "Robust Learning and Segmentation for Scene Understanding," Massachusetts Institute of Technology, Department of Electrical Engineering & Computer Science.

Jia (Jane) Wu, S.M., May 2005. Thesis title: "Comparing Visual Features for Morphing Based Recognition," Massachusetts Institute of Technology, Department of Electrical Engineering & Computer Science.

Jacob V. Bouvrie, S.M., June 2004. Thesis title: "Multi-Source Contingency Clustering," Massachusetts Institute of Technology, Department of Electrical Engineering & Computer Science.

Alexandros Kyriakides, S.M., February 2004. Thesis title: "Supervised Information Retrieval for Text and Images," Massachusetts Institute of Technology, Department of Electrical Engineering & Computer Science.

Brian Leung, S.M., May 2004. Thesis title: "Component-based Car Detection in Street Scene Images," Massachusetts Institute of Technology, Department of Electrical Engineering & Computer Science.

Pascal Paysan, S.M., Computer Science, Fachhochschule Esslingen, February 2004. Thesis title: "Stereovision-based Vehicle Classification Using Support Vector Machines."

Sanmay Das, S.M., June 2003. Thesis Title: "Intelligent Market-Making in Artificial Markets," Massachusetts Institute of Technology, Department of Electrical Engineering & Computer Science.

Brian Kim, S.M., June 2003. Thesis Title: "Multi-Source Human Identification," Massachusetts Institute of Technology, Department of Electrical Engineering & Computer Science.

Jennifer Louie, S.M., May 2003. Thesis Title: "A Biological Model of Object Recognition with Feature Learning," Massachusetts Institute of Technology, Department of Electrical Engineering & Computer Science.

Ezra Rosen, S.M., May 2003. Thesis Title: "Face Representation in Cortex: Studies Using a Simple and Not So Special Model," Massachusetts Institute of Technology, Department of Electrical Engineering & Computer Science.

Stanley Bileschi, S.M., February 2003. Thesis Title: "Advances in Component Based Face Detection," Massachusetts Institute of Technology, Department of Electrical Engineering & Artificial Intelligence Laboratory.

Jennifer Huang, S.M. January 2003. Thesis title: "Component-based Face Recognition with 3D Morphable Models," Massachusetts Institute of Technology, Department of Electrical Engineering & Computer Science.

Andrew Crane, S.M. September 2002. Thesis title: "Object Recognition with Partially Labeled Examples," Massachusetts Institute of Technology, Department of Electrical Engineering & Computer Science.

Purdy Ho, S.M., May 2001. Thesis title: "Rotation Invariant Real-time Face Detection and Recognition System," Massachusetts Institute of Technology, Department of Electrical Engineering & Computer Science.

Luis Pérez-Breva, Ingeniería Superior Industrial Química, July 1999. Thesis title: "Applying Learning Techniques to Solve Engineering Problems: Preprocessing, Learning and Measuring," Universitat Ramon Llull, Barcelona, Spain. [Internship Program]

Jon Wang, S.M. May 1999. Thesis title: "Information Aggregation and Dissemination in Simulated Markets," Massachusetts Institute of Technology, Department of Computer Science.

Janet Marques, S.M., May 1999. Thesis title: "An Automatic Annotation System for Audio Data Containing Music," Massachusetts Institute of Technology, Department of Electrical Engineering & Computer Science.

Christian Shelton, S.M., May 1998. Thesis title: "Three-Dimensional Correspondence," Massachusetts Institute of Technology, Department of Electrical Engineering & Artificial Intelligence Laboratory.

Stephen Lines, S.M., June 1996. Thesis title: "The Photo-Realistic Synthesis of Novel Views from Example Images," Massachusetts Institute of Technology, Electrical Engineering & Computer Science.

Elaine Yiu, Ph.D., June 1996. Thesis title: "Image Classification Using Color Cues and Texture Orientation," Massachusetts Institute of Technology, Electrical Engineering & Computer Science.

Nicholas Chan, S.M., May 1995. Thesis title: "The Complexity and A Priori Knowledge of Learning from Examples," Massachusetts Institute of Technology, Department of Computer Science.

Anuj Mohan, S.M., June 1999. Thesis title: "Robust Object Detection in Images by Computers," Massachusetts Institute of Technology, Department of Computer Science.

James Hutchinson, S.M., June 1986; Ph.D., February 1994. S.M. Thesis title: "Early Vision Problem Solving with Analog and Binary Resistive Networks," Massachusetts Institute of Technology, Department of Electrical Engineering & Computer Science. Ph.D. Thesis title: "A Radial Basis Function Approach to Financial Time Series Analysis," Massachusetts Institute of Technology, Department of Electrical Engineering & Computer Science.

Michael Jones, S.M., September 1992. Thesis title: "Using Recurrent Networks for Dimensionality Reduction," Massachusetts Institute of Technology, Department of Electrical Engineering & Computer Science.

Vijay Balasubramanian, S.M., June 1992. Thesis title: "Equivalence and Reduction of Hidden Markov Models," Massachusetts Institute of Technology, Department of Electrical Engineering & Computer Science.

Mike Drumheller, S.M., May 1989. Thesis title: "Synthesizing a Motion Detector from Examples," Massachusetts Institute of Technology, Department of Brain & Cognitive Sciences.

Terry Sanger, S.M., June 1989. Thesis title: "Optimal Unsupervised Learning in Feedforward Neural Networks," Massachusetts Institute of Technology, Department of Brain & Cognitive Sciences.

Walter Gillett, S.M., June 1988. Thesis title: "Issues in Parallel Stereomatching," Massachusetts Institute of Technology, Department of Brain & Cognitive Sciences.

Harry Voorhees, S.M., June 1987. Thesis title: "Finding Texture Boundaries in Images," Massachusetts Institute of Technology, Department of Electrical Engineering & Computer Science.

Jonathan Bliss, S.M., February 1986. Thesis title: "Velocity-tuned Spatio-temporal Interpolation and Approximation in Vision," Massachusetts Institute of Technology, Department of Electrical Engineering & Computer Science.

Bror Saxberg, S.M., May 1985; M.D./PhD., May 1989. S.M. Thesis title: "Parameters of a Three-Dimensional Free Fall Trajectory from its Two-Dimensional Central Projection," Massachusetts Institute of Technology, Department of Electrical Engineering & Computer Science. Ph.D. Thesis title: "A Modern Differential Geometric Approach to Shape from Shading," Massachusetts Institute of Technology, Department of Electrical Engineering & Computer Science.

Katie Cornog, S.M., February 1985. Thesis title: "Computer Controlled Eye-head Movement Coordination for a Robot: Fixation and Smooth Pursuit," Massachusetts Institute of Technology, Department of Electrical Engineering & Computer Science.

Michael Kass, S.M., June 1984. Thesis title: "Computing Stereo Correspondence," Massachusetts Institute of Technology, Department of Electrical Engineering & Computer Science.

Eric Tiffany, S.M., June 1983. Thesis title: "Stereo Image Registration Using Monocular Image Features," Massachusetts Institute of Technology, Department of Electrical Engineering & Computer Science.

#### FORMER POSTDOCTORAL FELLOWS/ASSOCIATES:

Guillermo D. Canas, 2011-2013

Jacob Bouvrie, Postdoctoral Fellow, 2012-2013

Pavan K. Mallapragada, Postdoctoral Fellow, 2010-2011

Neva Cherniavsky, Postdoctoral Fellow, 2010-2011

SangWan Lee, Postdoctoral Fellow, 2010-2011

[Stan Bileschi](#), Postdoctoral Fellow, 2006-2009

[Adlar Kim](#) Postdoctoral Fellow, 2008-2009

[Thomas Serre](#) Postdoctoral Fellow, 2006-2009

[Davide Zoccolan](#) (*with DiCarlo*) Postdoctoral Fellow, Postdoctoral Associate, SISSA (HFSP Fellowship), 2003-2008

Stanley Bileschi, Postdoctoral Fellow, July 2006-December 2006.

[Gabriel Kreiman](#), Postdoctoral Associate, McGovern Institute for Brain Research, 2005-2006; Postdoctoral Fellow-Whitman Fellowship, School of Science, 2002-2005.

[Tony Ezzat](#), Postdoctoral Associate, 2002-2006.

[Lior Wolf](#), Postdoctoral Associate, 2005-2006; Postdoctoral Fellow-Rothschild Fellowship, 2004.

[Andrea Caponnetto](#), Postdoctoral Fellow, 2004-2006.

[Sayan Mukherjee](#), Postdoctoral Associate, 2001-2004.

[Maximilian Riesenhuber](#), Postdoctoral Fellow-McDonnell-Pew Fellowship, 2000-2003.

[Bernd Heisele](#), Postdoctoral Fellow, 1999-2001.

[Martin Giese](#), Postdoctoral Fellow, 1998-2000.

[Massimiliano Pontil](#), Postdoctoral Fellow, 1997-2000.

Michael Oren, Postdoctoral Fellow, 1995-1997.

[Pawan Sinha](#), Postdoctoral Fellow, 1995-1997.

[Partha Niyogi](#), Postdoctoral Fellow, 1996-1997.

[Amnon Shashua](#), Postdoctoral Fellow, McDonnell Pew Fellowship, 1992-1994.

Sebastian Tölg, Postdoctoral Fellow, Fellowship of the Deutsche Forschungsgemeinschaft, 1992-1993.

[Lyle Borg-Graham](#), Postdoctoral Fellow, 1992-1993.

[Thomas Vetter](#), Postdoctoral Fellow, 1991-1993.

[Norberto Grzywacz](#), Postdoctoral Fellow, 1984-1988.

[John G. Harris](#), Postdoctoral Fellow, NSF New Technologies Fellowship, 1991-1993.

[Shimon Edelman](#), Postdoctoral Fellow-Weizmann Fellowship, 1988-1990; Postdoctoral Associate, 1990-1991.

[Daphna Weinshall](#), Postdoctoral Fellow, 1988-1991.

[Manfred Fahle](#), Postdoctoral Fellow, Heisenberg Award, Deutsche Forschungsgemeinschaft, 1989-1990.

[James J. Little](#), Postdoctoral Fellow, 1985-1989.



[Hanspeter Mallot](#), Postdoctoral Fellow, 1986-1988.

[Alessandro Verri](#), Postdoctoral Fellow, 1986-1988.

[Heinrich Buelthoff](#), Postdoctoral Fellow, 1985-1986.

[Andrew Parker](#), Postdoctoral Fellow, MRC Fellowship, 1984-1985.

[Christof Koch](#), Postdoctoral Fellow, Thyssen Foundation Fellowship, 1982-1984.

Keith Nielsen, Postdoctoral Fellow, NIH Fellowship, 1982-1984.

#### FORMER RESEARCH SCIENTISTS/RESEARCH AFFILIATES:

[Tony Ezzat](#) Research Scientist, 2006-2009

[Federico Giroi](#) Research Affiliate, 2000-2003.

[Norberto Grzywacz](#) Research Scientist, Center for Biological Information Processing, 1988-1993.

#### FORMER STUDENTS AND POSTDOCS (\*) NOW FACULTY

[Thomas Breuel](#) University of Kaiserslautern, Germany

[Heinrich Buelthoff](#) Director, Max Planck Institute, Tuebingen

[Shimon Edelman](#)\* Cornell University, New York

[Theodoros Evgeniou](#) INSEAD, Fontainebleau, France

[Manfred Fahle](#) Bremen University, Germany

[Davi Geiger](#) New York University

[Martin Giese](#)\* Tuebingen University, Germany

[Norberto Grzywacz](#)\* University of Southern California

[John G. Harris](#)\* University of Florida, Tallahassee

[Anya Hurlbert](#) Newcastle Medical School, United Kingdom

[Ulf Knoblich](#) Allen Institute for Brain Science

[Christof Koch](#)\* California Institute of Technology

[Gabriel Kreiman](#)\* Harvard Medical School, Children's Hospital

[James J. Little](#)\* University of British Columbia, Vancouver, Canada

[Hanspeter Mallot](#)\* Tuebingen University, Germany

[Minoru Maruyama](#)\* Shinshu University, Nagano, Japan

[José L. Marroquín Zaleta](#) Centro de Investigación en Matemáticas, Guanajuato, Mexico

Ethan Meyers Hampshire College

[Sayan Mukherjee](#) Duke University

[Partha Niyogi](#)\* University of Chicago

[Andrew Parker](#)\* Oxford University, United Kingdom

[Massimiliano Pontil](#)\* University of Sienna, Italy

[Alexander Rakhlin](#) Wharton School, University of Pennsylvania

[Maximilian Riesenhuber](#)\* Georgetown University Medical School, Washington, DC

[Terry Sanger](#) Stanford University, California

[Thomas Serre](#) Brown University

[Amnon Shashua](#)\* Hebrew University, Jerusalem, Israel

[Christian Shelton](#) University of California, Riverside

[Pawan Sinha](#)\* Massachusetts Institute of Technology

[Brian Subirana](#) IESE Business School, University of Navarra, Spain

[Alessandro Verri](#)\* University of Genoa, Italy

[Thomas Vetter](#) Basel University, Switzerland

[Daphna Weinshall](#)\* Hebrew University, Jerusalem, Israel

[Lior Wolf](#)\* Tel Aviv University, Jerusalem, Israel

[Woodward Yang](#) Harvard University

[Gene W. Yeo](#) UCSD

[Angela Yu](#) UCSD

## PUBLICATIONS

(Statistics: h-index (from Publish or Perish) = 80 in 2008)

## BOOKS

*Letters written in memory of David Marr by his friends and colleagues: Peter Rado, Tony Pay, G. S. Brindley, Benjamin Kaminer, Francis H. Crick, Whitman Richards, Tommy Poggio, Shimon Ullman, Ellen Hildreth*, MIT Press, These letters were originally published in Lucia Vaina, Editor: *From the Retina to the Neocortex: Selected Papers of David Marr* (Boston: Birkhäuser, 1991) and are made available here with the kind permission of Lucia Vaina.

*Vision: A Computational Investigation into the Human Representation and Processing of Visual Information*, D. Marr, Afterword by T. Poggio, MIT Press Cambridge, MA, 2010

*Biologically Motivated Computer Vision*, H.H. Bülthoff, S.W. Lee, T.A. Poggio, C. Wallraven (eds.), Second IEEE International Workshop, BMCV 2002, Tübingen, Germany, November 22-24, 2002. Proceedings

*Perceptual Learning*, Fahle, M. and T. Poggio (eds.), MIT Press, Cambridge, MA, 2002.

*Biologically Motivated Computer Vision*, Lee, S-W., H.H. Buelthoff and T. Poggio (eds.), First IEEE International Workshop, BMCV 2000, Seoul, Korea, May 2000.

*Early Visual Learning*, S. Nayar and T. Poggio (eds.), Oxford University Press, 1996.

*Exploring Brain Functions: Models in Neuroscience* (Proceedings of the 1992 Dahlem Conference), D.A. Glaser and T. Poggio (eds.), John Wiley & Sons, New York, NY, 1993.

*L'Occhio e il Cervello: Che cosa significa "vedere"*, T. Poggio (with M. Fontana) Edizione Theoria, Rome, Italy, 1991.

*Theoretical Approaches in Neurobiology*, W. Reichardt and T. Poggio (eds.), MIT Press, Cambridge, MA, 1980.

## JOURNAL ARTICLES

Anselmi, F. and T. Poggio, Representation Learning in Sensory Cortex: a theory. CBMM Memo No. 23. November 2014. CBMM Funded.

Anselmi, F. J.Z. Leibo, L. Rosasco, J. Mutch, A. Tacchetti, and T. Poggio, Unsupervised learning of invariant representations with low sample complexity: the magic of sensory cortex or a new framework for machine learning?, CBMM Memo No. 001. arXiv:1311.4158v5. March 2014. CBMM Funded.

Evangelopoulos, G., S. Voinea, C. Zhang, L. Rosasco, and T. Poggio, Learning An Invariant Speech Representation, CBMM Memo No. 22. arXiv:1406.3884. June 2014. CBMM Funded

Isik, L., E.M. Meyers, J.Z. Leibo, T. Poggio, The dynamics of invariant object recognition in the human visual system, Journal of Neurophysiology, Oct 2, 2013 doi:10.1152/jn.00394.2013, PMID: 24089402

Liao, Q., J.Z. Leibo and T Poggio, Learning invariant representations and applications to face verification. *Advances in Neural Information Processing Systems*, 26. (3057-3065). NIPS 2013. Lake Tahoe, Nevada. February 2014. CBMM Funded.

Liao, Q., J.Z. Leibo, Y. Mroueh, and T. Poggio, Can a biologically-plausible hierarchy effectively replace face detection, alignment, and recognition pipelines?, CBMM Memo No. 003. arXiv:1311.4082v3. March 2014. CBMM Funded.

Leibo, J.Z., Q. Liao, F. Anselmi, T. Poggio, The invariance hypothesis implies domain-specific regions in visual cortex, BioRxiv doi: 10.1101/004473.

Leibo J.Z.\*, Liao Q\*, Poggio T. Subtasks of Unconstrained Face Recognition (2014), 9th International Joint Conference on Computer Vision, Imaging and Computer Graphics Theory and Applications. (VISAPP). Lisbon, Portugal, January 2014,\* = authors contributed equally.

Poggio, T.A., J. Mutch, L. Isik. Computational role of eccentricity dependent cortical magnification. CBMM Memo No. 017. arXiv:1406.1770v1 . June 2014. CBMM Funded

Tan C. and T. Poggio. Neural tuning size is a key factor underlying holistic face processing. CBMM Memo No. 21. arXiv:1406.3793 . June 2014. CBMM Funded

Zhang C., S. Voinea, G. Evangelopoulos, L. Rosasco, and T. Poggio. Phone Classification by a Hierarchy of Invariant Representation Layers. INTERSPEECH 2014 . [accepted]. International Speech Communication Association (ISCA) . CBMM Funded.

Anselmi F., J.Z. Leibo, L. Rosasco, J. Mutch, A. Tacchetti, and T. Poggio, "Magic Materials: a theory of deep hierarchical architectures for learning sensory representations", CBCL paper, Massachusetts Institute of Technology, Cambridge, MA, September 27, 2013

Kim, H., J., Wohlwend, J.Z. Leibo, and T. Poggio, Body-form and body-pose recognition with a hierarchical model of the ventral stream, "MIT-CSAIL-TR-2013-013, CBCL-312", Massachusetts Institute of Technology, Cambridge, MA, June 20, 2013

Tan, C. and T. Poggio, "Faces as a Model Category" for Visual Object Recognition," MIT-CSAIL-TR-2013-004, CBCL-311, Massachusetts Institute of Technology, Cambridge, MA, March 18, 2013

Poggio, T. and T. Serre, "Models of Visual Cortex", Scholarpedia, March 3, 2013

Poggio, T. and S. Ullman, "Vision: are models of object recognition catching up with the brain?" 2013 New York Academy of Sciences, doi: 10.1111/nyas.12148.

Poggio, T., J. Mutch, F. Anselmi, A. Tacchetti, L. Rosasco, and J.Z. Leibo, "Does invariant recognition predict tuning of neurons in sensory cortex?", MIT-CSAIL-TR-2013-019, CBCL-313, Massachusetts Institute of Technology, Cambridge, MA, August 6, 2013

Villa, S., L. Rosasco and T. Poggio, On Learnability, Complexity and Stability, arXiv 1303.5976 March 24, 2013

Jhuang, H., E. Garrote, J. Mutch, X. Yu, V. Khilnani, T. Poggio, A.D. Steele, and T. Serre, "Automated home-cage behavioural phenotyping of mice". *Nature Communications*, 1, Article 68, [doi: 10.1038/ncomms1064], September 7, 2010.

Chikkerur, S., T. Serre, C. Tan, and T. Poggio, "What and Where: A Bayesian inference theory of visual attention", *Vision Research*, [doi: 10.1016/j.visres.2010.05.013], May 20, 2010

Roy, J.E., Riesenhuber, M., T. Poggio and E.K. Miller, "Prefrontal cortex activity during flexible categorization". *Journal of Neuroscience*, 30:8519-8528, 2010

Smale, S., L. Rosasco, J. Bouvrie, A. Caponnetto, and T. Poggio, "Mathematics of the Neural Response", *Foundations of Computational Mathematics*, June 2009 (online)

Kouh, M, T. Poggio. "A Canonical Neural Circuit for Cortical Nonlinear Operations" *Neural Computation*, June 2008, Vol. 20, No. 6, Pages 1427-1451

Meyers, E.M.; D. J. Freedman; G. Kreiman; E.K. Miller; and T. Poggio. "Dynamic Population Coding of Category Information in Inferior Temporal and Prefrontal Cortex". *Journal of Neurophysiology* Vol. 100: 1407-1419, June 18, 2008.

LeCun, Y., D.G. Lowe, J. Malik, J. Mutch, P. Perona, and T. Poggio Object Recognition, Computer Vision, and the Caltech 101: A Response to Pinto et al., *PLoS Computational Biology*, Posted Online March 2008

Cadiou, C., M. Kouh, A. Pasupathy, C. Connor, M. Riesenhuber, and T. Poggio. [A Model of V4 Shape Selectivity and Invariance](#), *Journal of Neurophysiology*, Vol. 98, 1733-1750, June, 2007.

Serre, T., A. Oliva and T. Poggio. [A Feedforward Architecture Accounts for Rapid Categorization](#), *Proceedings of the National Academy of Sciences (PNAS)*, Vol. 104, No. 15, 6424-6429, 2007.

Heisele, B., T. Serre and T. Poggio. [A Component-based Framework for Face Detection and Identification](#), *International Journal of Computer Vision*, 74(2), pp. 167-181, 2007.

Serre, T., G. Kreiman, M. Kouh, C. Cadiou, U. Knoblich and T. Poggio. [A Quantitative Theory of Immediate Visual Recognition](#). In: *Progress in Brain Research* (special volume on computational neuroscience), Vol. 104, No. 15, 6424-6429, 2007.

Serre, T., L. Wolf, S. Bileschi, M. Riesenhuber and T. Poggio. [Object Recognition with Cortex-like Mechanisms](#), *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 29, 3, 411-426, 2007.

Zoccolan, D., M. Kouh, A. Pasupathy, C. Connor, M. Riesenhuber, and T. Poggio. Trade-off between object selectivity and tolerance in monkey inferotemporal cortex, *The Journal of Neuroscience*, Volume 27(45), pp.12292–12307, November 7, 2007.

Kreiman, G., C.P. Hung, A. Kraskov, R.Q. Quiroga, T. Poggio and J.J. DiCarlo. [Object Selectivity of Local Field Potentials and Spikes in the Macaque Inferior Temporal Cortex](#), *Neuron*, Vol. 49, 433-445, 2006.

Mukherjee, S., P. Niyogi, T. Poggio and R. Rifkin. [Learning Theory: Stability is Sufficient for Generalization and Necessary and Sufficient for Consistency of Empirical Risk Minimization](#), *Advances in Computational Mathematics*, 25, 161-193, 2006.

Freedman, D.J., M. Riesenhuber, T. Poggio and E.K. Miller. [Experience-Dependent Sharpening of Visual Shape Selectivity in Inferior Temporal Cortex](#), *Cerebral Cortex*, December 2005.

Hung, C.P., G. Kreiman, T. Poggio and J.J. DiCarlo. [Fast Readout of Object Identity from Macaque Inferior Temporal Cortex](#), *Science*, Vol. 310, 863-866, 2005.

Rakhlin, A., S. Mukherjee and T. Poggio. [Stability Results in Learning Theory](#), *Analysis and Applications*, Vol. 3, No. 4, 397-417, 2005.

Yeo, G., E. Van Nostrand, D. Holste, T. Poggio and C.B. Burge. [Identification and Analysis of Alternative Splicing Events Conserved in Human and Mouse](#), *Proceedings of the National Academy of Sciences (PNAS)*, 102, 8, 2850-2855, 2005.

Lampl, I., D. Ferster, T. Poggio and M. Riesenhuber. [Intracellular Measurements of Spatial Integration and the MAX Operation in Complex Cells of the Cat Primary Visual Cortex](#), *Journal of Neurophysiology*, 92, 2704-2713, 2004.

Poggio, T. [Q & A - Discussion](#), *Current Biology*, Vol. 14, Issue 23, R985-R986, December 2004.

Poggio, T. and E. Bizzi. [Generalization in Vision and Motor Control](#), *Nature*, Vol. 431, 768-774, 2004.

Poggio, T.P. and M. Poggio. [Francis Harry Compton Crick](#), *Physics Today*, 80-81, November 2004.

Poggio, T., R. Rifkin, S. Mukherjee and P. Niyogi. [General Conditions for Predictivity in Learning Theory](#), *Nature*, Vol. 428, 419-422, 2004.

Freedman, D.J., M. Riesenhuber, T. Poggio, and E.K. Miller. [Comparison of Primate Prefrontal and Inferior Temporal Cortices during Visual Categorization](#), *Journal of Neuroscience*, 23, 5235-5246, 2003.

Giese, M. and T. Poggio. [Neural Mechanisms for the Recognition of Biological Movements](#), *Nature Neuroscience Review*, Vol. 4, 179-192, March 2003.

Heisele, B., P. Ho, J. Wu and T. Poggio. [Face Recognition: Component-based versus Global Approaches](#), *Computer Vision and Image Understanding*, Vol. 91, No. 1/2, 6-21, 2003.

Heisele, B., T. Serre, S. Prentice and T. Poggio. [Hierarchical Classification and Feature Reduction for Fast Face Detection with Support Vector](#), *Pattern Recognition*, 36, 2007-2017, 2003.

Nakajima, C., M. Pontil, B. Heisele and T. Poggio. [Full-body Person Recognition System](#), *Pattern Recognition*, 36, 1997-2006, 2003.

Poggio, T. and S. Smale. [The Mathematics of Learning: Dealing with Data](#), *Notices of the American Mathematical Society (AMS)*, Vol. 50, No. 5, 537-544, 2003. (See journal issue at [AMS Notices](#).)

Rifkin, R., S. Mukherjee, P. Tamayo, S. Ramaswamy, C.-H. Yeang, M. Angelo, M. Reich, T. Poggio, E.S. Lander, T.R. Golub and J.P. Mesirov. [An Analytical Method for Multi-class Molecular Cancer Classification](#), *SIAM Reviews* Vol. 45, No. 4, 706-723, 2003.

Ezzat, T., G. Geiger and T. Poggio. "Trainable Videorealistic Speech Animation," *ACM SIGGRAPH 2002*, San Antonio, TX, July 2002.

Heisele, B., A. Verri and T. Poggio. [Learning and Vision Machines](#), *IEEE Visual Perception: Technology & Tools*, Vol. 90, No. 7, 1164-1177, 2002.

Evgeniou, T., M. Pontil, C. Papageorgiou and T. Poggio. [Image Representations and Feature Selection for Multimedia Database Search](#), *IEEE Transactions in Knowledge and Data Engineering*, Vol. 15, No. 4, 911-920, July/August 2002.

Freedman, D.J., M. Riesenhuber, T. Poggio, and E.K. Miller. [Visual Categorization and the Primate Prefrontal Cortex: Neurophysiology and Behavior](#), *Journal of Neurophysiology*, 88, 930-942, 2002.

Pomeroy, S.L., P. Tamayo, M. Gaasenbeek, L.M. Sturia, M. Angelo, M.E. McLaughlin, J.Y.H. Kim, L.C. Goumnerova, P.M. Black, C. Lau, J.C. Allen, D. Zagzag, M.M. Olson, T. Curran, C. Wetmore, J.A. Biegel, T. Poggio, S. Mukherjee, R. Rifkin, A. Califano, G. Stolovitzky, D. N. Louis, J.P. Mesirov, E.S. Lander and T.R. Golub. [Prediction of Central Nervous System Embryonal Tumour Outcome Based on Gene Expression](#), *Nature (Letters to Nature)*, 415, 436-442, 2002.

Riesenhuber, M. and T. Poggio. [Neural Mechanisms of Object Recognition](#), *Current Opinion in Neurobiology*, 12, 162-168, 2002.

Sinha, P. and T. Poggio. [United We Stand: The Role of Head Structure in Face Recognition](#), *Perception*, 31/1, 133, 2002.

Yu, A.J., M.A. Giese and T. Poggio. [Biophysically Plausible Implementations of the Maximum Operation](#), *Neural Computation*, Vol. 14, No. 12, 2857-2881, 2002.

Freedman, D.J., M. Riesenhuber, T. Poggio and E.K. Miller. [Categorical Representation of Visual Stimuli in the Primate Prefrontal Cortex](#), *Science*, 291, 312-316, 2001.

Mohan, A., C. Papageorgiou and T. Poggio. [Example-based Object Detection in Images by Components](#), *IEEE (PAMI)*, Vol. 23, No. 4, 349-361, April 2001.

Ramaswamy, S., P. Tamayo, R. Rifkin, S. Mukherjee, C.-H. Yeang, M. Angelo, C. Ladd, M. Reich, E. Latulippe, J.P. Mesirov, T. Poggio, W. Gerald, M. Loda, E.S. Lander, and T.R. Golub. [Multiclass Cancer Diagnosis Using Tumor Gene Expression Signatures](#), *PNAS*, Vol. 98, No. 26, 15149-15154, December 2001.

Poggio, T. and C. Shelton. [Learning in Brains and Machines](#), *Spatial Vision*, Vol. 13, No. 2-3, 287-296,

De Mori, R. and T. Poggio. Information Retrieval e Biblioteche Digitali, *Technology Review: Edizione Italiana*, 13, 1, February 2000.

Evgeniou, T., M. Pontil and T. Poggio. [Statistical Learning Theory: A Primer](#), *International Journal of Computer Vision*, 38, 1, 9-13, 2000.

Evgeniou, T., Pontil, M. and T. Poggio. [Regularization Networks and Support Vector Machines](#), *Advances in Computational Mathematics*, 13, 1, 1-50, 2000.

Ezzat, T. and T. Poggio. [Visual Speech Synthesis by Morphing Visemes](#), *International Journal of Computer Vision*, 38, 1, 45-57, 2000.

Giese, M.A. and T. Poggio. [Morphable Models for the Analysis and Synthesis of Complex Motion Pattern](#), *International Journal of Computer Vision*, 38, 1, 59-73, 2000.

Papageorgiou, C. and T. Poggio. [A Trainable System for Object Detection](#), *International Journal of Computer Vision*, 38, 1, 15-33, 2000.

Poggio, T. [Second Wave of Network Technologies](#), *The Future of Software*, 1, 1, 84-85, Winter 2000/2001.

Poggio, T. and A. Verri. [Introduction: Learning and Vision at CBCL](#), *International Journal of Computer Vision*, 38, 1, 5-7, 2000.

Riesenhuber, M., and T. Poggio. [Models of Object Recognition](#), *Nature Neuroscience*, 3 Supp., 1199-1204, 2000.

Koch, C. and T. Poggio. [Predicting the Visual World: Silence is Golden](#), *Nature Neuroscience*, Vol. 2, No. 1, 9-10, January 1999.

Poggio, T. and Shelton, C. [Machine Learning, Machine Vision and the Brain](#), *AI Magazine*, Vol. 20, No. 3, 37-55, 1999.



- Rachlevsky-Reich, B., I. Ben-Shaul, N. Tung Chan, A. Lo and T. Poggio. [GEM: A Global Electronic Market System](#), *Information Systems*, Vol. 24, No. 6, p. 495-518, 1999.
- Riesenhuber, M. and T. Poggio. [Hierarchical Models of Object Recognition in Cortex](#), *Nature Neuroscience*, 2, 1019-1025, 1999.
- Riesenhuber, M. and T. Poggio. [Are Cortical Models Really Bound by the 'Binding Problem'?](#), *Neuron* 24, 87-93, 1999.
- Niyogi, P., F. Girosi, and T. Poggio. [Incorporating Prior Information in Machine Learning by Creating Virtual Examples](#), *Proceedings of the IEEE*, Vol. 86, No. 11, 2196-2209, September 1998.
- Jones, M. and T. Poggio. [Multidimensional Morphable Models: A Framework for Representing and Matching Object Classes](#), *International Journal of Computer Vision*, Vol. 29, No. 2, 107-131, 1998.
- Poggio, T. and F. Girosi. [A Sparse Representation for Function Approximation](#), *Neural Computation*, Vol. 10, No. 6, 1445-14454, 1998.
- Sung, K.K. and T. Poggio. [Example-Based Learning for View-Based Human Face Detection](#), *IEEE PAMI*, Vol. 20, No. 1, 39-51, 1998.
- Vetter, T. and T. Poggio. [Linear Object Classes and Image Synthesis from a Single Example Image](#), *IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI)*, Vol 19, No. 7, 733-742, July 1997.
- Brunelli, B. and T. Poggio. [Template Matching: Matched Spatial Filters and Beyond](#), *Pattern Recognition*, Vol. 30, No. 5, 751-768, 1997.
- Jones, M., P. Sinha, T. Vetter, and T. Poggio. [Top-Down Learning of Low-Level Vision Tasks](#), *Current Biology*, Vol. 7, No. 12, 991-994, 1997.
- Schoelkopf, B., K.K. Sung, C. Burges, F. Girosi, P. Niyogi, T. Poggio and V. Vapnik. [Comparing Support Vector Machines with Gaussian Kernels to Radial Basis Function Classifiers](#), *IEEE Transactions on Signal Processing*, Vol. 45, No. 11, 2758-2765, 1997.
- Sinha, P. and T. Poggio. [Response to 'Comment' article by Lamouret, Cornilleau-Peres and Droulez](#), *Cognitive Sciences*, Vol. 1, No. 2, 43-84, 1997.
- Beymer, D. and T. Poggio. [Image Representation for Visual Learning](#), *Science*, 272, 1905-1909, 1996.
- Sinha, P. and T. Poggio. [I think I Know that Face...](#), *Nature (Correspondence)*, Vol. 384, No. 6608, 404, 1996.
- Sinha, P. and T. Poggio. [Role of Learning in Three-dimensional Form Perception](#), *Nature*, Vol. 384, No. 6608, 460-463, 1996.
- Brunelli, R., D. Falavigna, T. Poggio and L. Stringa. [Automatic Person Recognition by Acoustic and Geometric Features](#), *Machine Vision and Applications*, Vol. 8, 5, 317-325, 1995.
- Fahle, M., S. Edelman, and T. Poggio. [Fast Perceptual Learning in Visual Hyperacuity](#), *Vision Research*, Vol. 35, 21, 3003-3013, 1995.
- Girosi, F., M. Jones, and T. Poggio. [Regularization Theory and Neural Networks Architectures](#), *Neural Computation*, Vol. 7, No. 2, 219-269, 1995.
- Logothetis, N.K., J. Pauls, and T. Poggio. [Shape Representation in the Inferior Temporal Cortex of Monkeys](#), *Current Biology*, Vol. 5, No. 5, 552-563, 1995.
- Sung, K.K. and T. Poggio. [Finding Human Faces with a Gaussian Mixture Distribution-based Face Model](#), *Recent Progress in Computer Vision*, LNCS Series, Springer-Verlag, 1995.
- Vetter, T., A. Hurlbert, and T. Poggio. [View-based Models of 3D Object Recognition: Invariance to Imaging Transformations](#), *Cerebral Cortex*, Vol. 5, No. 3, 261-269, 1995.
- Ancona, N. and T. Poggio. [Optical Flow from 1-D Correlation: Application to a Simple Time-to-Crash Detector](#), *International Journal of Computer Vision*, Vol. 14, 131-146, 1995.
- Vetter, T. and T. Poggio. [Symmetric 3D Objects are an Easy Case for 2D Object Recognition](#), *Spatial Vision*, 8, No. 4, 443-453, 1994.
- Poggio, T. [L'Intelligenza e Saper Imparare](#), *Sistemi & Impresa*, No. 4, 19-22, 1994.
- Logothetis, N.K., J. Pauls, H. Bülthoff and T. Poggio. [View-dependent Object Recognition by Monkeys](#), *Current Biology*, 4, No. 5, 401-414, 1994.

- Hutchinson, J.M., A. Lo and T. Poggio. [A Nonparametric Approach to Pricing and Hedging Derivative Securities Via Learning Networks](#), *Journal of Finance*, Vol. XLIX, No. 3, 851-889, 1994.
- Vetter, T., T. Poggio and H. Bülthoff. [The Importance of Symmetry and Virtual Views in Three-dimensional Object Recognition](#), *Current Biology*, 4, No. 1, 18-23, 1994.
- Poggio, T. [In Memorium: Werner Reichardt, 1924-1992](#), *Biological Cybernetics*, 69, 1, 1-3, 1993.
- Brunelli, R. and T. Poggio. [Caricatural Effects in Automated Face Perception](#), *Biological Cybernetics*, 69, 235-241, 1993.
- Brunelli, R. and T. Poggio. [Face Recognition: Features Versus Templates](#), *IEEE PAMI*, 15, 1042-1052, 1993.
- Poggio, T., S. Edelman and M. Fahle. [Learning of Visual Modules from Examples: A Framework for Understanding Adaptive Visual Performance](#), *Computer Vision, Graphics and Image Processing B: Image Understanding*, 56, No. 1, 22-30, 1992.
- Wyatt, J.L., C. Keast, M. Seidel, D. Standley, B. Horn, T. Knight, C. Sodini, H.-S. Lee and T. Poggio. [Analog VLSI Systems for Image Acquisition and Fast Early Vision Processing](#), *International Journal of Computer Vision*, 8, No. 3, 217-230, 1992.
- Poggio, T. and L. Stringa. [A Project for an Intelligent System: Vision and Learning](#), *International Journal of Quantum Chemistry*, 42, 727-739, 1992.
- Poggio, T., M. Fahle and S. Edelman. [Fast Perceptual Learning in Visual Hyperacuity](#), *Science*, 256, 1018-1021, May 1992.
- Edelman, S. and T. Poggio. [Bringing the Grandmother Back into the Picture: A Memory-based View of Object Recognition](#), *International Journal of Pattern Recognition of Artificial Intelligence*, 6, 37-61, April, 1992.
- Edelman, S. and T. Poggio. [Models of Object Recognition](#), *Current Opinion in Neurobiology*, 1, 270-273, 1991.
- Weems, C., C. Brown, J. Webb, and J. Kender. [Parallel Processing in the DARPA Strategic Computing Vision Program](#), *IEEE Expert*, 6, 23-38, October 1991.
- Poggio, T. and F. Girosi. [Networks for Approximation and Learning](#), *Proceedings of the IEEE* (special issue: Neural Networks I: Theory and Modeling), Vol. 78, No. 9, 1481-1497, September 1990.
- Kanade, K., T. Binford, T. Poggio and A. Rosenfeld. [Vision](#), *Annual Review of Computer Science* 4, 517-529, 1990.
- Girosi, F. and T. Poggio. [Networks and the Best Approximation Property](#), *Biological Cybernetics*, 63, 3, 169-176, 1990.
- Edelman, S. and T. Poggio. [A Network that Learns to Recognize 3D Objects](#), *Nature*, 343, 263-266, 1990.
- Poggio, T. and F. Girosi. [Regularization Algorithms for Learning that are Equivalent to Multilayer Networks](#), *Science*, 247, 978-982, 1990.
- Poggio, T. [Visione Biologica and Visione Artificiale](#), *SFERA*, 6, 164-5, 1989.
- Girosi, F. and T. Poggio. [Representation Properties of Networks: Kolmogorov's Theorem is Irrelevant](#), *Neural Computation*, 1, 465-469, 1989.
- Poggio, T. [Oltre l'Immagine" or "Beyond the Image](#), *Ulisse 2000*, 63, 76-86, June 1989.
- Edelman, S. and T. Poggio. [Integrating Visual Cues for Object Segmentation and Recognition](#), *Optics News*, 15, 8-16, 1989.

- Gamble, E., D. Geiger, T. Poggio and D. Weinshall. [Integration of Vision Modules and Labelling of Surface Discontinuities](#), *IEEE Trans. Systems, Man & Cybernetics*, 19, 6, 1576-1581, 1989.
- Bülthoff, H.H., J. Little and T. Poggio. [A Parallel Algorithm for Real Time Computation of Optical Flow](#), *Nature*, 337, 549-553, 1989.
- Hurlbert, A. and T. Poggio. [Rendere le Macchine \(e l'Intelligenza Artificiale\) in Grado di Vedere](#), *Sistemi Intelligenti*, 1, 75-103, 1989.
- Verri, A. and T. Poggio. [Motion Field and Optical Flow: Qualitative Properties](#), *IEEE Trans. PAMI*, 11, 490-498, 1989.
- Bertero, M., T. Poggio and V. Torre. [Ill-posed Problems in Early Vision](#), *Proceedings of the IEEE*, 76, 869-889, 1988.
- Chellappa, R., K. Fukushima, A.K. Katsaggelos, S-Y. Kung, Y. LeCun, N.M. Nasrabadi, T. Poggio. [Applications of Artificial Neural Networks to Image Processing](#), Guest Editorial for *IEEE Transactions on Image Processing: Special Issue on Applications of Artificial Neural Networks to Image Processing*, Volume 7, Number 8, August 1998.
- Little, J., T. Poggio, and E.B. Gamble. [Seeing in Parallel: The Vision Machine](#), *International Journal of Supercomputer Applications*, 2, 4, 13-28, 1988.
- Poggio, T., E. Gamble and J. Little. [Parallel Integration of Vision Modules](#), *Science*, 242, 436-440, 1988.
- Voorhees, H. and T. Poggio. [Computing Texture Boundaries from Images](#), *Nature*, 333, 364-367, 1988.
- Poggio, T., H. Voorhees and A. Yuille. [A Regularized Solution to Edge Detection](#), *Journal of Complexity*, 4, 106-123, 1988.
- Hurlbert, A. and T. Poggio. [Synthesizing a Color Algorithm from Examples](#), *Science*, 239, 482-485, 1988.
- Poggio, T. and C. Koch. [Synapses that Compute Motion](#), *Scientific American*, 256, 46-52, 1987.
- Marroquin, J., S. Mitter and T. Poggio. [Probabilistic Solution of Ill-posed Problems in Computational Vision](#), *Journal of American Statistical Association*, 82, 76-89, 1987.
- Hurlbert, A. and T. Poggio. [Do Computers Need Attention?](#), *Nature*, 321, 651-652, 1986.
- Koch, C., V. Torre and T. Poggio. [Computations in the Vertebrate Retina: Gain Enhancement, Differentiation and Motion Discrimination](#), *Trends in Neurosciences*, 9, 204-211, 1986.
- Yuille, A.L. and T. Poggio. [Scaling Theorems for Zero Crossings](#), *IEEE Trans. PAMI*, 8, 15-25, 1986.
- Torre, V. and T. Poggio. [On Edge Detection](#), *IEEE Trans. PAMI*, 8, 147-163, 1986.
- Poggio, T. and C. Koch. [Ill-posed Problems in Early Vision: From Computational Theory to Analog Networks](#), *Proceedings of the Royal Society London B*, 226, 303-323, 1985.
- Hurlbert, A. and T. Poggio. [Spotlight on Attention](#), *Trends in Neurosciences*, 8, 309-311, 1985.
- Poggio, T., V. Torre and C. Koch. [Computational Vision and Regularization Theory](#), *Nature*, 317, 314-319, 1985.
- Poggio, T. [Early Vision: From Computational Structure to Algorithms and Parallel Hardware](#), *Computer Vision, Graphics, and Image Processing*, 31, 139-155, 1985.
- Koch, C. and T. Poggio. [The Biophysical Properties of Spines as a Basis for their Electrical Function: A Comment on Kawato and Tsukahara, 1983](#), *Journal of Theoretical Biology*, 113, 225-229, 1985.
- Koch, C. and T. Poggio. [A Simple Algorithm for Solving the Cable Equation in Dendritic Trees of Arbitrary Geometry](#), *J. Neuroscience Methods*, 12, 303-315, 1985.
- Yuille, A. and T. Poggio. [Fingerprints Theorems for Zero Crossing](#), *J. Optical Society America A*, 2, 683-692, 1985.



- Nielsen, K.R.K. and T. Poggio. [Vertical Image Registration in Stereopsis](#), *Vision Research*, 24, 1133-1140, 1984.
- Poggio, T. [Vision by Man and Machine](#), *Scientific American*, 250, 106-116, 1984.
- Poggio, G. and T. Poggio. [The Analysis of Stereopsis](#), *Annual Review of Neuroscience*, 7, 379-412, 1984.
- Koch, C. and T. Poggio. [A Theoretical Analysis of Electrical Properties of Spines](#), *Proceedings of the Royal Society London B*, 218, 455-477, 1983.
- Koch, C., T. Poggio and V. Torre. [Nonlinear Interactions in a Dendritic Tree: Localization, Timing and Role in Information Processing](#), *PNAS*, 80, 2799-2802, 1983.
- Reichardt, W., T. Poggio and K. Hausen. [Figure-ground Discrimination by Relative Movement in the Visual System of the Fly - II: Towards the Neural Circuitry](#), *Biological Cybernetics*, 46, 1-30, 1983.
- Koch, C. and T. Poggio. [Electrical Properties of Dendritic Spines](#), *Trends in Neurosciences*, 6, 80-83, 1983.
- Nishihara, H.K. and T. Poggio. [Hidden Cues in Random-line Stereograms](#), *Nature*, 300, 347-349, 1982.
- Wehrhahn, C., T. Poggio and T. Bülthoff. [Tracking and Chasing in Houseflies \(Musca\): An Analysis of 3D Flight Trajectories](#), *Biological Cybernetics*, 45, 123-130, 1982.
- Koch, C., T. Poggio and V. Torre. [Retinal Ganglion Cells: A Functional Interpretation of Dendritic Morphology](#), *Proceedings of the Royal Society London*, 298, 227-264, 1982.
- Fahle, M. and T. Poggio. [Visual Hyperacuity: Spatiotemporal Interpolation in Human Vision](#), *Proceedings of the Royal Society London B*, 213, 451-477, 1981.
- Poggio, T. [Marr's Computational Approach to Vision](#), *Trends in Neurosciences*, 10, 258-262, 1981.
- Poggio, T., W. Reichardt and W. Hausen. [A Neuronal Circuitry for Relative Movement Discrimination by the Visual System of the Fly](#), *Naturwissenschaften*, 68, 9, 443-466, 1981.
- Poggio, T. and W. Reichardt. [Visual Fixation and Tracking by Flies: Mathematical Properties of Simple Control Systems](#), *Biological Cybernetics*, 40, 101-112, 1981.
- Geiger, G. and T. Poggio. [Asymptotic Oscillations in the Tracking Behavior of the Fly \*Musca Domestica\*](#), *Biological Cybernetics*, 41, 197-201, 1981.
- Poggio, T. and W. Reichardt. [On the Representation of Multi-input Systems: Computational Properties of Polynomial Algorithms](#), *Biological Cybernetics*, 37, 3, 167-186, 1980.
- Bülthoff, H., T. Poggio and C. Wehrhahn. [3D Analysis of the Flight Trajectories of Flies \(\*Drosophila Melanogaster\*\)](#), *Z. Naturforsch*, 35c, 811-815, 1980.
- Poggio, T. [Review of Movements of the Eyes](#), *The Quarterly Review of Biology*, R.H.S. Carpenter, 54, 118, 1979.
- Marr, D., T. Poggio and E. Hildreth. [Smallest Channel in Human Vision](#), *Journal of the Optical Society of America*, 70, 868-870, 1979.
- Marr, D. and T. Poggio. ["A Computational Theory of Human Stereo Vision,"](#) *Proceedings of the Royal Society London B*, 204, 301-328, 1979.
- Marr, D., S. Ullman and T. Poggio. [Bandpass Channels, Zero-crossings and Early Visual Information Processing](#), *Journal of the Optical Society of America*, 69, 914-916, 1979.
- Reichardt, W. and T. Poggio. [Figure-Ground Discrimination by Relative Movement in the Visual System of the Fly](#), *Biological Cybernetics*, 35, 81-100, 1979.

- Palm, G. and T. Poggio. [Stochastic Identification Methods for Nonlinear Systems: An Extension of the Wiener Theory](#), *SIAM Journal of Applied Mathematics*, 34, 524-535, 1978.
- Marr, D., G. Palm and T. Poggio. [Analysis of a Cooperative Stereo Algorithm](#), *Biological Cybernetics*, 28, 4, 223-239, 1978.
- Torre, V. and T. Poggio. [A Synaptic Mechanism Possibly Underlying Directional Selectivity Motion](#), *Proceedings of the Royal Society London B*, 202, 409-416, 1978.
- Palm, G. and T. Poggio. [The Volterra Representation and the Wiener Expansion: Validity and Pitfalls](#), *SIAM Journal of Applied Mathematics*, 33, 195-216, 1977.
- Palm, G. and T. Poggio. [Wiener-like System Identification in Physiology](#), *Journal of Mathematical Biology*, 4, 4, 375-381, 1977.
- Poggio, T. and V. Torre. [A Volterra Representation of Some Neuron Models](#), *Biological Cybernetics*, 27, 2, 113-124, 1977.
- Geiger, G. and T. Poggio. [On Head and Body Movements of Flying Flies](#), *Biological Cybernetics*, 25, 3, 177-180, 1977.
- Poggio, T. and W. Reichardt. [Visual Control of Orientation Behavior in the Fly. Part II: Towards the Underlying Neural Interactions](#), *Quarterly Review of Biophysics*, 9, 377-438, 1976.
- Reichardt, W. and T. Poggio. [Visual Control of Orientation Behavior in the Fly. Part I: A Quantitative Analysis](#), *Quarterly Review of Biophysics*, 3, 311-375, 1976.
- Marr, D., and T. Poggio. [Cooperative Computation of Stereo Disparity](#), *Science*, 194, 283-287, 1976.
- Wehrhahn, C. and T. Poggio. [Real-time Delayed Tracking in Flies](#), *Nature*, 261, 43-44, 1976.
- Heimburger, L., T. Poggio and W. Reichardt. [A Special Case of Nonlinear Interactions in the Visual System of the Fly](#), *Biological Cybernetics*, 21, 103-105, 1976.
- Geiger, G. and T. Poggio. [The Muller-Lyer Figure and the Fly](#), *Science*, 190, 479-480, 1975.
- Poggio, T. [A Theory of Nonlinear Interactions in Multi-inputs \(nervous\) Systems](#), *Exp. Brain Res.*, Supplement to Vol. 23, 163, 1975.
- Poggio, T. [On Optimal Nonlinear Associative Recall](#), *Biological Cybernetics*, 19, 201-209, 1975.
- Geiger, G. and T. Poggio. [The Orientation of the Fly towards Visual Patterns: On the Search for the Underlying Functional Interactions](#), *Biological Cybernetics*, 19, 39-54, 1975.
- Reichardt, W. and T. Poggio. [A Theory of the Pattern Induced Flight Orientation of the Fly, Musca Domestica, II,](#) *Biological Cybernetics*, 18, 69-80, 1975.
- Poggio, T. and W. Reichardt. [Considerations on Models of Movement Detection](#), *Kybernetik*, 13, 4, 223-227, 1973.
- Borsellino, A. and T. Poggio. [Convolution and Correlation Algebras](#), *Kybernetik*, 13, 2, 113-122, 1973.
- Poggio, T. [On Holographic Models of Memory](#), *Kybernetik*, 12, 4, 237-238, 1973.
- Poggio, T. and W. Reichardt. [A Theory of Pattern Induced Flight Orientation of the Fly, Musca Domestica,](#) *Kybernetik*, 12, 185-203, 1972.
- Borsellino, A. and T. Poggio. [Holographic Aspects of Temporal Memory and Optomotor Responses](#), *Kybernetik*, 10, 1, 58-60, 1972.

#### OTHER ARTICLES

- "Q & A – Discussion," Poggio, T., *Current Biology*, Vol. 14, Issue 23, R985-R986, December 2004.
- "Francis Harry Compton Crick," Poggio, T. and M. Poggio. *Physics Today*, 80-81, November 2004.
- "Memories of a friend of Francis and Odile," (T. Poggio). Remembering Francis Crick, Salk Institute, Sept 2004.
- "Caro Signor Turing Urge un Altro Test: E una macchina che Impari da Sola," (T. Poggio). *La Memoria*, 1992.
- "Economic Models and Time Series: Learning from Examples," (T. Poggio). *The Tactician* (Citicorp Technology), 4, 2, 28-31, 1991.
- "Ora Anche la Macchina Sta Per Aprire Gli Occhi," (T. Poggio). *Il Sole 24 Ore*, 274, 1, October 1990.
- "L'Impareggiabile Esploratore," (T. Poggio). *Il Pensiero Informatico*, 4, 2-7, June 1990.
- "Intelligenza e Macchine," (T. Poggio). *ITC Informa*, 3, No. 2, 58-63, 1988.
- "Calcolatori Paralleli: Imitazione del Cervello?" (T. Poggio). *Repubblica*, 1, No. 2, 1986.

#### CHAPTERS IN BOOKS

- Poggio, T. (2014). "Tomaso Poggio" In L. R. Squire (Ed.), *The History of Neuroscience in Autobiography, Volume 8*. Oxford University Press, New York, New York.
- Serre, T., G. Kreiman, M. Kouh, C. Cadieu, U. Knoblich and T. Poggio. "A Quantitative Theory of Immediate Visual Recognition. In: Progress in Brain Research (special volume on computational neuroscience), 2007 in press.
- "How the Brain Might Work: The Role of Information and Learning in Understanding and Replicating Intelligence" (T. Poggio). In: Information: Science and Technology for the New Century, editors-G. Jacovitt, A. Pettorossi, R. Consolo and V. Senni, Lateran University Press, Quaderni Sefir, 7, pp. 45-61, 2007.
- "Object Recognition with Features Inspired by Visual Cortex," (Serre, T., L. Wolf and T. Poggio). In: Proceedings of 2005 IEEE Computer Society Conference on Computer Vision and Pattern Recognition (CVPR), IEEE Computer Society Press, San Diego, June 2005.
- "Direction Estimation of Pedestrian from Multiple Still Images," (Shimizu, H. and T. Poggio). In: IEEE Intelligent Vehicles Symposium 2004, Parma, Italy, June 14-17, 2004.
- "Oriented Filters for Object Recognition: An Empirical Study.," (Yokono, J.J. and T. Poggio). In: Proceedings of the Sixth IEEE International Conference on Automatic Face and Gesture Recognition (FGR2004, Seoul, Korea), 755-760, 2004.
- "Trainable Videorealistic Speech Animation," (Ezzat, T., G. Geiger and T. Poggio). In: Proceedings of the Sixth IEEE International Conference on Automatic Face and Gesture Recognition (FGR2004, Seoul, Korea), 57-64, 2004.
- "La Teoria del 'Learning': Introduzione e Applicazioni," (Poggio, T.). In: La Matematica nel Mondo della Natura (Eds.) C. Bartocci, G.I. Bischì, L.C. Orsini, E. Carletti, G. Manuzio, R. Parodi, F. Pastrone, T. Poggio, Erga Edizioni, Genova, 131-138, 2004.

"Regularized Least Squares Classification." (Rifkin, R., G. Yeo and T. Poggio). In: Advances in Learning Theory: Methods, Model and Applications, NATO Science Series III: Computer and Systems Sciences, VIOS Press, Amsterdam, (Eds.) Suykens, Horvath, Basu, Micchelli and Vandewalle, Vol. 190, Chapter 7, 131-154, 2003.

"How Visual Cortex Recognizes Objects: The Tale of the Standard Model," (Riesenhuber, M. and T. Poggio). In: The Visual Neurosciences, (eds.) L.M. Chalupa and J.S. Werner, MIT, Press, Cambridge, MA, 1640-1653, 2003.

"b" (Poggio, T., S. Mukherjee, R. Rifkin, A. Raklin, A. Verri). In: Uncertainty in Geometric Computations, J. Winkler and M. Niranjan (eds.), Kluwer Academic Publishers, 131-141, 2002.

"Feature Selection for SVMs," (J. Weston, S. Mukherjee, O. Chapelle, M. Pontil, T. Poggio, and V. Vapnik). In: Advances in Neural Information Processing Systems, NIPS, 13, 668-674, 2001.

"Incorporating Prior Information in Machine Learning by Creating Virtual Examples," (Niyogi, P., T. Poggio, and F. Girosi). In: Intelligent Signal Processing, (eds.) S. Haykin, B. Kosko, IEEE Press, Piscataway, NJ, 127-162, 2001.

"Sparse Correlation Kernel Reconstruction and Superresolution," (Papageorgiou, C., F. Girosi and T. Poggio). In: Probabilistic Models of the Brain, (eds.) R. Rao, B. Olshausen and M. Lewicki, The MIT Press, Cambridge, MA, 2001.

"Incremental and Decremental Support Vector Machine Learning," (Cauwenberghs, G. and T. Poggio). In: Advances in Neural Information Processing Systems (NIPS\*2000), M.I.T. Press, Vol. 13, 409-415, Cambridge, MA, 2000.

"High-level Learning of Early Perceptual Tasks," (P. Sinha and T. Poggio). In: Perceptual Learning, (Ed.) Manfred Fahle, MIT Press, Cambridge, MA, 2000.

"Vision and Learning," (T. Poggio). In: MIT Encyclopedia of the Cognitive Sciences, R. Wilson and F. Keil (eds.), MIT Press, 863-864, 1999.

"Networks that Learn for Image Understanding," (T. Poggio and K.-K. Sung). In: Advances in Image Understanding, K. Bowyer and N. Ahuja (eds.), IEEE Computer Society Press, 226-240, 1996.

"Early Visual Learning," (S. K. Nayar and T. Poggio). In: Early Visual Learning, S. Nayar and T. Poggio (eds.), Oxford University Press, 43-66, 1996.

"Regularization Networks for Visual Learning" (T. Poggio and D. Beymer). In: Early Visual Learning, S. Nayar and T. Poggio (eds.), Oxford University Press, 43-66, 1996.

"Finding Human Faces with a Gaussian Mixture Distribution-based Face Model," (K.-K. Sung and T. Poggio). In: Recent Progress in Computer Vision, LNCS Series, Springer-Verlag, 1995.

"Observations on Cortical Mechanisms for Object Recognition and Learning," (T. Poggio and A. Hurlbert). In: Large Scale Neuronal Theories of the Brain, C. Koch and J. Davis, eds., M.I.T. Press, Cambridge, MA, 153-182, 1994.

"Report on Workshop on High Performance Computing and Communication for Grand Challenge Applications: Computer Vision, Speech and Natural Language Processing, and Artificial Intelligence," (B.W. Wah, T.S. Huang, A.K. Joshi, D. Moldovan, J. Aloimonos, R.K. Bajcsy, D. Ballard, D. DeGroot, K. DeJong, C.R. Dyer, S.E. Fahlman, R. Grishman, L. Hirschman, R.E. Korf, S.E. Levinson, D.P. Miranker, N.H. Morgan, S. Nirenburg, T. Poggio, E.M. Riseman, C. Stanfill, S.J. Stolfo, S.L. Tanimoto, and C. Weems). In: IEEE Trans. Knowledge and Data Engineering, 6, No. 1, 138-154, 1993.

"Recognition and Structure from One 2-D Model View: Some Observations on Prototypes, Object Classes and Symmetries," (T. Poggio and T. Vetter). In: From Galileo's 'Occhialino' to Optoelectronics, P. Mazzoldi (ed.), World Scientific Publishing, London, 241-271, 1993.

"The MIT Vision Machine: Progress in the Integration of Vision Modules," (T. Poggio and D. Weinshall). In: Markov Random Fields: Theory and Applications, R. Chellappa and A. Jain (eds.), Academic Press, Orlando, FL, 447-471, 1993.

"3D Object Recognition and Matching: On a Result of Basri and Ullman," (T. Poggio). In: Spatial Vision in Humans and Robots, L. Harris and M. Jenkin (eds.), Cambridge University Press, Cambridge, UK, 1993.

"Multiplying with Synapses and Neurons," (C. Koch and T. Poggio). In: Single Neuron Computation, T. McKenna, J. Davis, and S.F. Zornetzer (eds.), Academic Press, Boston, 315-345, 1992.

"Bringing the Grandmother Back into the Picture: A Memory-Based View of Object Recognition," (S. Edelman and T. Poggio). In: Neural Networks in Vision and Pattern Recognition, J. Skrzypek and W. Karplus (eds.), World Scientific Publishing, New Jersey, 37-61, 1992.

"Networks for Approximation and Learning," (T. Poggio and F. Girosi). In: Foundations of Neural Networks, C. Lau, editor, IEEE Press, Piscataway, NJ, 91-106, 1992.

"Postscript," (T. Poggio). In: From the Retina to the Neocortex: Selected Papers of David Marr, L. Vaina (ed.), Birkhauser, Boston, MA, 320-325, 1991.

"Networks for Learning: A View from the Theory of Approximation of Functions," (F. Girosi and T. Poggio). In: Neural Networks: Concepts, Applications and Implementations, Vol. I, P. Antognetti and V. Milutinovic (eds.), Prentice-Hall, Englewood Cliffs, NJ, 110-153, 1991.

"Artificial Intelligence - An Update," (S. Edelman and T. Poggio). In: Neuroscience Year 1990, G. Adelman (ed.), Birkhauser, Boston, 1990.

"The MIT Vision Machine," (T. Poggio, J. Little, E. Gamble, W. Gillett, D. Geiger, D. Weinshall, M. Villalba, N. Larson, T. Cass, H. Bulthoff, M. Drumheller, P. Oppenheimer, W. Yang and A. Hurlbert). In: Artificial Intelligence at MIT: Expanding Frontiers, Vol. II, P.H. Winston and S.A. Shellard (eds.), M.I.T. Press, Cambridge, MA, 492-529, 1990.

"Computational Vision and Regularization Theory," (T. Poggio, V. Torre and C. Koch). In: Artificial Intelligence at MIT: Expanding Frontiers, Vol. II, P.H. Winston and S.A. Shellard (eds.), M.I.T. Press, Cambridge, MA, 472-491, 1990.

"HyperBF: A Powerful Approximation Technique for Learning," (T. Poggio and F. Girosi). In: Artificial Intelligence at MIT: Expanding Frontiers, Vol. I, P.H. Winston and S.A. Shellard (eds.), M.I.T. Press, Cambridge, MA, 270-285, 1990.

"Computation of Motion by Real Neurons," (N. Grzywacz and T. Poggio). In: An Introduction to Neural and Electronic Networks, S.F. Zornetzer, J.L. Davis, and C. Lau, (eds.), Academic Press, San Diego, CA, 379-403, 1990.

"Visual Integration and Detection of Discontinuities: The Key Role of Intensity Edges," (E. Gamble and T. Poggio). In: The Brain and Intelligence, Natural and Artificial, O. Barnabei, A. Borromei, and C. Orlandi, (eds.), Edizione L'inchiostruolu, Bologna, Italy, 209-237, 1990.

"Vision: The 'Other' Face of AI," (T. Poggio). In: Modelling the Mind, K.A. Mohyeldin Said, W.H. Newton-Smith, R. Viale and K.V. Wilkes (eds.), Clarendon Press, Oxford, UK, 1990.

- "Vision by Man and Machine," (T. Poggio). In: Information Processing and Mental Representations, Springer-Verlag, New York, 1990.
- "Artificial Intelligence," (D. McDermott and T. Poggio). In: Computer Science: Achievements and Opportunities, Report of the NSF Advisory Committee for Computer Research, J.E. Hopcroft and K.W. Kennedy (eds.), SIAM, Philadelphia, 41-50, 1989.
- "Parallel Integration of Vision Modules," (T. Poggio, E. Gamble and J. Little). In: From Molecules to Models: Advances in Neuroscience, K.E. Kelner and D.E. Koshland, (eds.), AAAS, Washington, DC, 330-337, 1989.
- "Synthesizing a Color Algorithm from Examples," (A. Hurlbert and T. Poggio). In: From Molecules to Models: Advances in Neuroscience, K.L. Kelner and D.E. Koshland, (eds.), AAAS, Washington, DC, 338-343, 1989.
- "A Parallel Vision Machine that Learns," (T. Poggio). In: Models of Brain Function, (Models of Brain Function Meeting, Copenhagen, Denmark, June, 1989), R. Cotterill (ed.), University of Cambridge Press, Cambridge, UK, 51-88, 1989.
- "Intelligenza Artificiale," (P. Dell'Orco and T. Poggio). In: Enciclopedia Italiana, Istituto della Enciclopedia Italiana, 506-527, 1989.
- "Making Machines (and AI) See," (A. Hurlbert and T. Poggio). In: Daedalus: Proceedings of the American Academy of Arts and Sciences, 117, 213-239, 1988.
- "Scaling and Fingerprint Theorems for Zero-crossings," (A.L. Yuille and T. Poggio). In: Advances in Computer Vision, C. Brown (ed.), Lawrence Erlbaum Assoc., Hillsdale, NJ, 47-78, 1988.
- "Computer Vision," (T. Poggio). In: Biological and Artificial Intelligence Systems, E. Clementi and S. Chin, eds., ESCOM Science Publishers, Leiden, 471-483, 1988.
- "Artificial Intelligence," (C. Koch and T. Poggio). In: Encyclopedia of Neuroscience, Vol. I, G. Adelman (ed.), Birkhauser, Boston, 77-80, 1987.
- "Artificial Intelligence," (T. Poggio). In: Innovative Multi-Information Dictionary, Annual Series (IMIDAS), Kiyoshi Asano (ed.), Tuttle-Mori Agency, Tokyo, 16-18, 1987.
- "Information Processing in Nerve Cells," (C. Koch and T. Poggio). In: Encyclopedia of Neuroscience, Vol. I, G. Adelman (ed.), Birkhauser, Boston, 528-531, 1987.
- "Computational Vision and Regularization Theory," (T. Poggio, V. Torre and C. Koch). In: Readings in Computer Vision, M.A. Fischler and O. Firschein (eds.), Morgan Kaufmann Publishers, Los Altos, CA, 1987.
- "Biophysics of Computational Systems: Neurons, Synapses, and Membranes," (C. Koch and T. Poggio). In: Synaptic Function, G.M. Edelman, W.E. Gall, and W.M. Cowan (eds.), John Wiley & Sons, New York, 637-697, 1987.
- "Level Crossings and the Panum Area," (D. Geiger and T. Poggio). In: Proceedings IEEE Computer Society Workshop on Computer Vision, IEEE, Miami, FL, 211-214, December 1987.
- "On Parallel Stereo," (M. Drumheller and T. Poggio). In: Proceedings IEEE International Conference on Robotics and Automation, April 7-10, 1986.
- "Vision by Man and Machine," (T. Poggio). In: Progress in Neuroscience - Readings from Scientific American, W.H. Freeman & Company, New York, 91-101, 1986.

"The Synaptic Veto Mechanism: Does It Underlie Direction and Orientation Selectivity in the Visual Cortex?" (C. Koch and T. Poggio). In: Models of the Visual Cortex, D. Rose and V.G. Dobson (eds.), John Wiley & Sons, New York, 408-419, 1985.

"Scaling Theorems for Zero Crossing," (A.L. Yuille and T. Poggio). In: Advances in Computer Vision, L. Erlbaum Assoc., Hillsdale, NJ, 1, 147-174, 1985.

"Scaling Theorems for Zero Crossings," (A.L. Yuille and T. Poggio). In: Image Understanding, 1985, W. Richards and S. Ullman (eds.), Ablex Publishing, 1985.

"Visual Algorithms," (T. Poggio). In: Physical and Biological Processing of Images, O.J. Braddick and A.C. Sleight (eds.), Springer Verlag, Berlin, 128-153, 1983.

"Micro-networks in Nerve Cells," (C. Koch, T. Poggio and V. Torre). In: Competition and Cooperation in Neural Nets, M. Arbib (ed.), Springer Verlag, Berlin, 105-110, 1982.

"Trigger Features or Fourier Analysis in Early Vision: A New Point of View," (T. Poggio). In: Lecture Notes in Biomathematics, Vol. 44, The Recognition of Pattern and Form, D. Albrecht (ed.), Springer Verlag, Berlin, 88-99, 1982.

"The Computational Problem of Motor Control," (T. Poggio and B. Rosser). In: Machine Intelligence 10, Hayes, Mitchie and Pao (eds.), 519-530, 1982.

"Visual Control of Flight in Flies," (W. Reichardt and T. Poggio). In: Theoretical Approaches in Neurobiology, T. Poggio and W. Reichardt (eds.), M.I.T. Press, Cambridge, MA, 135-150, 1981.

"Characterization of Non-linear Interaction in the Fly's Visual System," (T. Poggio and W. Reichardt). In: Theoretical Approaches in Neurobiology, T. Poggio and W. Reichardt (eds.), M.I.T. Press, Cambridge, MA, 64-84, 1981.

"Wiener-like Identification Techniques," (W. Reichardt and T. Poggio). In: Theoretical Approaches in Neurobiology, T. Poggio and W. Reichardt (eds.), M.I.T. Press, Cambridge, MA, 60-63, 1981.

"An Application: A Synaptic Mechanism Possibly Underlying Movement Detection," (V. Torre and T. Poggio). In: Theoretical Approaches in Neurobiology, T. Poggio and W. Reichardt (eds.), M.I.T. Press, Cambridge, MA, 39-46, 1981.

"A Theory of Synaptic Interactions," (T. Poggio and V. Torre). In: Theoretical Approaches in Neurobiology, T. Poggio and W. Reichardt (eds.), M.I.T. Press, Cambridge, MA, 28-38, 1981.

"An Information-processing Approach to Understanding the Visual Cortex," (F.H. Crick, D.C. Marr and T. Poggio). In: The Organization of the Cerebral Cortex, E.O. Schmitt, F.G. Worden and G.S. Dennis (eds.), M.I.T. Press, Cambridge, MA, 505-533, 1980.

"The Precision of Interpolation during Apparent Movement can be in the Hyperacuity Range," (M. Fahle and T. Poggio). In: Proceedings of IEEE International Conference on Visual Psychophysics and Medical Imaging, IEEE Catalogue No. 81CH 1676-6, C. Jaffe (ed.), 65-74, 1980.

"From Understanding Computation to Understanding Neural Circuitry," (D. Marr and T. Poggio). In: Neuronal Mechanisms in Visual Perception, E. Poppel, R. Held and J.E. Dowling (eds.), Neurosciences Res. Prog. Bull., 15, 470-488, 1977.

"Visually Guided Movements," (T. Poggio, E. Bizzi, R.E. Eckmiller, A.M. Graybiel, K.G. Gotz, M. Ito, M.F. Land, F.A. Miles, W. Reichardt, D.A. Robinson, D.C. Sandeman, P.H. Schiller and G. Westheimer). In: Function and Formation of Neural Systems, G.S. Stent (ed.), Dahlem Konferenzen, Berlin, 309-327, 1977.

"Processing of Visual Information in Insects: Outline of a Theoretical Characterization," (T. Poggio). In: Biocybernetics, V, H. Drischel and P. Dettmar (eds.), VEB Gustav Fischer Verlag, Jena, 235-242, 1975.

"Information Processing in Neural Networks: A Formal Analogy between Holographic Memories and Optomotor Responses," (T. Poggio). In: Biocybernetics IV, H. Drischel and P. Dettmar (eds.), VEB Gustav Fischer Verlag, Jena, 222-225, 1972.

#### CONFERENCE PROCEEDINGS

"The puzzle of initial invariance in object recognition" (JZ Leibo, J. Mutch, L. Rosasco, S. Ullman, and T. Poggio), SFN 2010, San Diego, November 13-17, 2010

"Do dorsal stream neurons encode combinations of local motion direction?" (C. Tan, Valerie Yorgan, Thomas Serre, David Sheinberg & Tomaso Poggio), SFN 2010, San Diego, November 13-17, 2010

"Identifying objects from brain activity in high-level visual cortex" (D. Hassabis, Cheston Tan, Thomas Serre & Tomaso Poggio), SFN 2010, San Diego, November 13-17, 2010

"Recognizing dynamic form: modeling and physiology" (D. Sheinberg, T. Poggio, T. Serre, C. Tan, V. Yorgan), CRCNS PI annual meeting, June 6-8, 2010

"How STS recognizes actions: predicting single-neuron responses in higher visual cortex", (C. Tan, J. Singer, T. Serre, D. Sheinberg & T. Poggio), VSS, May 7-12, 2010

"[Discriminative Word-Spotting Using Ordered Spectro-Temporal Patch Features](#)" (T. Ezzat.; T. Poggio) to appear: *SAPA Workshop, Interspeech*, Brisbane, Australia, 2008

"[Localized Spectro-Temporal Cepstral Analysis of Speech](#)" (J. Bouvrie, T. Ezzat, and T. Poggio), In: IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP), Las Vegas, 2008.

"Neuroscience: New Insights for AI?" (T. Poggio), In: [Web Intelligence Meets Brain Informatics, First WICI International Workshop, WImBI 2006](#), Beijing, China, 2007.

"A Biologically Inspired System for Action Recognition" (H. Jhuang, T. Serre, L. Wolf and T. Poggio). In: Proceedings of the Eleventh IEEE International Conference on Computer Vision (ICCV), Brazil, 2007.

"Spectro-Temporal Analysis of Speech Using 2-D Gabor Filters" (T. Ezzat, J. Bouvrie, and T. Poggio). In: Interspeech, Belgium, 2007.

"AM-FM Demodulation of Spectrograms using 2-D Max-Gabor Analysis" (T. Ezzat, J. Bouvrie, and T. Poggio). In: ICASSP, Hawaii, 2007

"Max-Gabor Analysis and Synthesis of Spectrograms" (T. Ezzat, J. Bouvrie and T. Poggio). In: Ninth International Conference on Spoken Language Processing (ICSLP-Pittsburgh, PA), 2006.

"Morphing Spectral Envelopes Using Audio Flow" (T. Ezzat, E. Meyers, J. Glass and T. Poggio). In: Proceedings of Interspeech-Eurospeech Conference, Lisbon, Portugal, 2545-2548, September 2005.

"Object Recognition with Features Inspired by Visual Cortex" (T. Serre, L. Wolf and T. Poggio). In: Proceedings of 2005 IEEE Computer Society Conference on Computer Vision and Pattern Recognition (CVPR), IEEE Computer Society Press, San Diego, June 2005.



- "Learning Features of Intermediate Complexity for the Recognition of Biological Motion" (R. Sigala, T. Serre, T. Poggio and M. Giese). In: ICANN 2005, Warsaw, Poland, 241-246, September 2005.
- "A Contour-Based Moving Object Detection and Tracking" (M. Yokoyama and T. Poggio). In: Second Joint IEEE International Workshop on Visual Surveillance and Performance Evaluation of Tracking and Surveillance (in conjunction with ICCV 2005), October, 2005.
- "Trainable Video-realist Speech Animation" (T. Ezzat, G. Geiger and T. Poggio). In: Proceedings of the Sixth IEEE International Conference on Automatic Face and Gesture Recognition (FGR2004, Seoul, Korea), 57-64, 2004.
- "La Teoria del 'Learning': Introduzione e Applicazioni" (T. Poggio). In: La Matematica nel Mondo della Natura, (Eds.) C. Bartocci, G.I. Bisch, L.C. Orsini, E. Carletti, G. Manuzio, R. Parodi, F. Pastrone, T. Poggio, Erga Edizioni, Genova, 131-138, 2004.
- "Direction Estimation of Pedestrian from Multiple Still Images" (H. Shimizu and T. Poggio). In: IEEE Intelligent Vehicles Symposium 2004, Parma, Italy, June 14-17, 2004, in press.
- "Oriented Filters for Object Recognition: An Empirical Study" (J.J. Yokono and T. Poggio). In: Proceedings of the Sixth IEEE International Conference on Automatic Face and Gesture Recognition (FGR2004, Seoul, Korea), 755-760, 2004.
- "Reanimating Faces in Images and Video" (V. Blanz, C. Basso, T. Poggio and T. Vetter). In: Proceedings of EUROGRAPHICS 2003, Brunet, P and Fellner, D (eds.), Granada, Spain, 2003.
- "Regression and Classification with Regularization" (S. Mukherjee, R. Rifkin and T. Poggio). In: Lectures Notes in Statistics: Nonlinear Estimation and Classification, Proceedings from MSRI Workshop, D.D. Denison, M.H. Hansen, C.C. Holmes, B. Mallick and B. Yu (eds.), Springer-Verlag, 171, 107-124, 2002.
- "On the Role of Object-Specific Features for Real World Object Recognition in Biological Vision" (T. Serre, M. Riesenhuber, J. Louie, T. Poggio). In: Biologically Motivated Computer Vision, Second International Workshop, (BMCV 2002), Tübingen, Germany, November 2002.
- "Recognizing Expressions by Direct Estimation of the Parameters of a Pixel Morphable Model" (V.P. Kumar, T. Poggio). In: Biologically Motivated Computer Vision, Second International Workshop, (BMCV 2002), Tübingen, Germany, November 2002.
- "Attentional Selection for Object Recognition – A Gentle Way" (Walther, D., L. Itti, M. Riesenhuber, T. Poggio, C. Koch). In: Biologically Motivated Computer Vision, Second International Workshop, (BMCV 2002), Tübingen, Germany, November 2002.
- "Visual Categorization: How the Monkey Brain Does It" (U. Knoblick, M. Riesenhuber, D.J. Freedman, E.K. Miller, T. Poggio). In: Biologically Motivated Computer Vision, Second International Workshop, (BMCV 2002), Tübingen, Germany, November 2002.
- "Extra-label Information: Experiments with View-based Classification" (A. Rakhlin, G. Yeo, and T. Poggio). In: Proceedings of the Sixth International Conference on Knowledge-Based Intelligent Information & Engineering Systems (KES' 2002), Podere d'Ombriano, Crema, Italy, September 16-18, 2002.
- "In: Handheld Face Identification Technology in a Pervasive Computing Environment" (E. Weinstein, P. Ho, B. Heisele, T. Poggio, K. Steele and A. Agarwal). Pervasive 2002, Zurich, Switzerland, August 26-28, 2002.
- "Categorization by Learning and Combining Object Parts," (B. Heisele, T. Serre, M. Pontil, T. Vetter and T. Poggio). In: Proceedings of Advances in Neural Information Processing Systems (NIPS'01), Vancouver, Canada, 2002, to appear.

- "Incremental and Decremental Support Vector Machine Learning," (G. Cauwenberghs and T. Poggio). In: Advances in Neural Information Processing Systems (NIPS\*2000), MIT Press, Vol. 13, 409-415, Cambridge, MA, 2001.
- "Face Recognition with Support Vector Machines: Global Versus Component-based Approach," (B. Heisele, P. Ho and T. Poggio). In: Proceedings of International Conference on Computer Vision (ICCV'01), Vancouver, Canada, Vol. 2, 688-694, 2001.
- "Component-based Face Detection," (Heisele, B., T. Serre, M. Pontil and T. Poggio). In: Proceedings of 2001 IEEE Computer Society Conference on Computer Vision and Pattern Recognition (CVPR 2001), IEEE Computer Society Press, Kauai, Hawaii, Vol. 1, 657-662, December 2001.
- "Feature Reduction and Hierarchy of Classifiers for Fast Object Detection in Video Images," (Heisele, B., T. Serre, S. Mukherjee and T. Poggio). In: Proceedings of 2001 IEEE Computer Society Conference on Computer Vision and Pattern Recognition (CVPR 2001), IEEE Computer Society Press, Kauai, Hawaii, Vol. 2, 18-24, December 2001.
- "Bounds on the Generalization Performance of Kernel Machine Ensembles," (T. Evgeniou, L. Perez-Breva, M. Pontil, and T. Poggio). In: Proceedings of Algorithmic Seventeenth International Conference on Machine Learning, Stanford University, June 29-July 2, 2000.
- "Feature Selection for SVMs," (J. Weston, S. Mukherjee, O. Chapelle, M. Pontil, T. Poggio and V. Vapnik). In: Proceedings of Neural Information Processing Systems, 2000.
- "Object Recognition and Detection by a Combination of Support Vector Machine and Rotation Invariant Phase Only Correlation," (C. Nakajima, I. Norihiko, M. Pontil, and T. Poggio). In: Proceedings of International Conference on Pattern Recognition, Barcelona, Spain, September, 2000.
- "People Recognition and Pose Estimation in Image Sequences," (C. Nakajima, M. Pontil and T. Poggio). In: Proceedings of IEEE-INNS-ENNS International Joint Conference on Neural Networks, Como, Italy, July, 2000.
- "Quantification and Classification of Locomotion Patterns by Spatio-temporal Morphable Models," (M.A. Giese and T. Poggio). In: Third IEEE Workshop on Visual Surveillance, Dublin, Ireland, July 1, 2000.
- "Visual Speech Synthesis by Morphing Visemes," (T. Ezzat and T. Poggio). In: NTT R&D, 49, 7, 372-375, 2000.
- "Learning-based Approach to Real Time Tracking and Analysis of Faces," (V. Kumar and T. Poggio). In: Proceedings of the Fourth International Conference on Face and Gesture Recognition, Grenoble, France, 91-96, March, 2000.
- "Imparare a Vedere," In: Enciclopedia Italiana Treccani, III, 675-685, 1999.
- "CBF: A New Framework for Object Categorization in Cortex," (M. Riesenhuber and T. Poggio). In: Biologically Motivated Computer Vision, Lee, S-W., H.H. Buelthoff and T. Poggio (eds.), First IEEE International Workshop, BMCV 2000, Seoul, Korea, May 2000.
- "Learning-based Neural Model for Visual Action Recognition," (M.A. Giese and T. Poggio). In: Society for Neuroscience Abstracts, Miami, FL, 25, 627, May 1999.
- "Recognition and Synthesis of Biological Motion Patterns by Linear Combination of Prototypical Image Sequences," (M. A. Giese. and T. Poggio). Göttingen Neurobiology Conference, Göttingen Neurobiology Report 1999, Thieme Verlag, Stuttgart, New York, p. 501, 1999.
- "Trainable Pedestrian Detection" (C. Papageorgiou and T. Poggio). In: Proceedings of International Conference on Image Processing, Kobe, Japan, October 1999.
- "A Pattern Classification Approach to Dynamical Object Detection" (C. Papageorgiou and T. Poggio). In: Proceedings of International Conference on Computer Vision, Corfu, Greece, 1223-1228, September 1999.

"Sparse Correlation Kernel Reconstruction" (C. Papageorgiou, F. Giroi, T. Poggio). In: Proceedings of International Conference on Acoustics, Speech, and Signal Processing, Phoenix, AZ, 1633-1636, March 1999.

"Synthesis and Recognition of Biological Motion Patterns Based on Linear Superposition of Prototypical Motion Sequences," (Giese, M.A. and T. Poggio). In: Proceedings of the IEEE Workshop on Multi-View Modeling and Analysis of Visual Scene, Fort Collins, CO, 73-80, 1999.

"A Trainable Pedestrian Detection System," (Papageorgiou, C., T. Evgeniou, S. Mukherjee, and T. Poggio). In: 1998 IEEE International Conference on Intelligent Vehicles, Volume 1, 241-246, October 1998, Stuttgart, Germany.

"A Trainable People Detection System" (C. Papageorgiou and T. Evgeniou). In: Proceedings of Intelligent Vehicles, October 1998.

"Hierarchical Morphable Models," (M. Jones and T. Poggio). In: Proceedings of Computer Vision and Pattern Recognition, Santa Barbara, CA, 820-826, June 23-25, 1998.

"MikeTalk: A Talking Facial Display Based on Morphing Visemes," (T. Ezzat and T. Poggio). In: Proceedings of the Computer Animation Conference, Philadelphia, PA, June 1998.

"A General Framework for Object Detection" (C. Papageorgiou, M. Oren, T. Poggio). In: Proceedings of the International Conference on Computer Vision, Bombay, India, January 4-7, 1998.

"Multidimensional Morphable Models: A Framework for Representing and Matching Object Classes," (M. Jones and T. Poggio). Proceedings of the Sixth International Conference on Computer Vision, Bombay, India, 683-688, January 4-7, 1998.

"Just One View: Invariances in Inferotemporal Cell Tuning" (T. Poggio and M. Riesenhuber). In: Advances in Neural Information Processing, 10, 1997.

"Video-realistic Talking Faces: A Morphing Approach" (T. Ezzat and T. Poggio). In: Proceedings of the Workshop on Audio-Visual Speech Processing, Rhodes, Greece, September 1997.

"Image-Based View Synthesis by Combining Trilinear Tensors and Learning Techniques," (S. Avidan, T. Evgeniou, A. Shashua and T. Poggio). In: Proceedings of the ACM Virtual Reality Software Technology Conference (VRST '97), September, 1997.

"Common Computational Strategies in Machine and Biological Vision" (Maximilian Riesenhuber and T. Poggio). In: Proceedings of the International Symposium on System Life, Tokyo, Japan, July, 1997.

"Robust Image-Based Reprojection Using the Trilinear Tensor," (T. Evgeniou and T. Poggio). In: IEEE Computer Society Conference on Computer Vision and Pattern Recognition (CVPR), Puerto Rico, June 1997.

"A Trainable Modular Vision System," (R. Brooks, E. Grimson, T. Poggio, C. Koch, C. Sodini, L. Stein, W. Yang). In: Proceedings of the 1997 Image Understanding Workshop, New Orleans, LA, 1307-1313, May 1997.

"A Forest of Sensors," (E. Grimson, P. Viola, O. Faugeras, T. Lorenzo-Perez, T. Poggio, S. Teller) In: Proceedings of the 1997 Image Understanding Workshop, New Orleans, LA, 45-50, May 1997.

"VSAM at the MIT Media Laboratory and CBCL: Learning and Understanding Action in Video Imagery," (A. Bobick, A. Pentland, T. Poggio). In: Proceedings of the 1997 Image Understanding Workshop, New Orleans, LA, 25-29, May 1997.

- "A Trainable System for People Detection," (M. Oren, C. Papageorgiou, P. Sinha, E. Osuna and T. Poggio). In: Proceedings of the 1997 Image Understanding Workshop, New Orleans, LA, 207-214, May 1997.
- "A Bootstrapping Algorithm for Learning Linear Models of Object Classes," (T. Vetter, M. Jones and T. Poggio). In: Proceedings of the 1997 Image Understanding Workshop, New Orleans, LA, May 1997.
- "A Bootstrapping Algorithm for Learning Linear Models of Object Classes," (Vetter, T., M. Jones and T. Poggio). In: IEEE Computer Society Conference on Computer Vision and Pattern Recognition (CVPR), Puerto Rico, 40-46, June 1997.
- "Pedestrian Detection Using Wavelet Templates," (Oren, M., C. Papageorgiou, P. Sinha, E. Osuna and T. Poggio). In: IEEE Computer Society Conference on Computer Vision and Pattern Recognition (CVPR), Puerto Rico, 193-199, June 1997.
- "Model-Based Matching by Linear Combinations of Prototype," (M. Jones and T. Poggio). In: Proceedings of the 1997 Image Understanding Workshop, New Orleans, LA, 1357-1365, May 1997.
- "3D Object Recognition: A Model of View-Tuned Neuron," (E. Bricolo, T. Poggio and N. Logothetis). In: Advances in Neural Information Processing Systems, M.I. Jordan, M.C. Mozer and T. Petsche, eds., M.I.T. Press, Cambridge, MA, 1997.
- "Image Representations for Graphics and Recognition." (T. Poggio, P. Sinha) In: Proceedings of the IS&T/SPIE Symposium on Electronic Imaging Science and Technology, San Jose Convention Center, San Jose, CA, February 14, 1997.
- "Facial Analysis and Synthesis Using Image-Based Models," (T. Ezzat and T. Poggio). In: Proceedings of the Second International Conference on Automatic Faces and Gesture Recognition, Killington, VT, 116-121, 1996.
- "Facial Analysis and Synthesis Using Image-Based Models," (T. Ezzat and T. Poggio). In: Proceedings of the Second International Conference on Automatic Faces and Gesture Recognition, Toulouse, France, August 1996.
- "Networks that Learn and How the Brain Works," (T. Poggio). In: Proceedings of Symposia in Pure Mathematics (PSPUM), D. Jerison, I.M. Singer and D.W. Stroock (eds.), American Mathematical Society, 1996.
- "Progress in Image Understanding at MIT" (W.E.L. Grimson, B.K.P. Horn, T. Poggio and the staff of the AI Laboratory). In: Proceedings of the Image Understanding Workshop, Morgan Kaufmann, San Francisco, CA, 65-74, 1996.
- "Face Verification for Real-time Applications," (R. Romano, D. Beymer and T. Poggio). In: Proceedings of the Image Understanding Workshop, Morgan Kaufmann, San Francisco, CA, 1996.
- "Image Synthesis From a Single Example View," (T. Vetter and T. Poggio). In: Proceedings of the European Conference on Computer Vision, 1996.
- "Finding Human Faces with a Gaussian Mixture Distribution-based Face Model," (K.-K. Sung and T. Poggio). In: Proceedings of Second Asian Conference on Computer Vision, Singapore, December 1995.
- "Model-based Matching of Line Drawings by Linear Combinations of Prototypes," (M. Jones and T. Poggio). In: Proceedings of the IEEE 5th International Conference on Computer Vision, IEEE Computer Society Press, Cambridge, MA, 531-536, June 1995.
- "Learning Networks for Face Analysis and Synthesis," (T. Poggio and D. Beymer). In: Proceedings of the International Workshop on Automatic Face- and Gesture-Recognition, Martin Bichsel (ed.), Zurich, Switzerland, 160-165, 1995.

"Face Recognition from One Example View," (Beymer, D. and T. Poggio). In: IEEE 5th International Conference on Computer Vision, IEEE Computer Society Press, Cambridge, MA, 500-507, June 1995.

"Example-based Learning for View-based Human Face Detection," (K.-K. Sung and T. Poggio). In: Proceedings from Image Understanding Workshop, (Morgan Kaufmann, San Mateo, CA), 843-850, November 13-16, 1994.

"Progress in Image Understanding at MIT," (W.E.L. Grimson, B.K.P. Horn, T. Poggio and the staff of the AI Laboratory). In: Proceedings of the Image Understanding Workshop, Morgan Kaufmann, San Francisco, CA, 37-42, 1994.

"Learning and Networks: Applications to Graphics and Very-Low Bandwidth Videoconferencing," (T. Poggio and D. Beymer). GOMAC94 Conference, California, 1994..

"Learning, Networks and Approximation Theory," (T. Poggio and F. Girosi). In: Atti del IV Congresso di Informatica e Neuroscienze, Associazione Nazionale di Informatica nelle Neuroscienze, Bari, Italy, 4-6, 1993.

"Learning Algorithms and Network Architectures," (T. Poggio and F. Girosi). In: Exploring Brain Functions: Models in Neuroscience, (Proceedings of the 1991 Dahlem Conference), T. Poggio and D. Glaser, eds., John Wiley & Sons, New York, NY, 77-96, 1993.

"Learning Algorithms and Network Architectures," (T. Poggio and F. Girosi). In: Brain Theory: Spatio-Temporal Aspects of Brain Function, (Proceedings of the 4th International Meeting on Brain Theory), A. Aertsen, ed., Elsevier Science Publishers, Amsterdam, 29-46, 1993.

"Optical Flow from 1D Correlation: Application to a Simple Time-to-Crash Detector," (N. Ancona and T. Poggio). In: Proceedings of the Fourth International Conference on Computer Vision, Berling, Germany, May 1993.

"Progress in Image Understanding at MIT," (W.E.L. Grimson, B.K.P. Horn, T. Poggio and the staff of the AI Laboratory). In: Proceedings of the Image Understanding Workshop, Morgan Kaufmann, San Mateo, CA, 49-66, 1993.

"Learning and Networks: Theory and Applications," (T. Poggio). In: Proceedings of the International Symposium on Artificial Neural Networks (ISANN). National Chiao Tung University, Taiwan, R.O.C., December 1993.

"From Regularization to Radial, Tensor and Additive Splines," (T. Poggio, F. Girosi and M. Jones). In: Neural Networks for Signal Processing: Proceedings of the 1993 IEEE-SP Workshop, C.A. Kamm et al. (eds.), IEEE Publishing, New York, 3-9, October 1993.

"From Regularization to Radial, Tensor and Additive Splines," (T. Poggio, F. Girosi and M. Jones). In: Proceedings of the 1993 International Joint Conference on Neural Networks, Nagoya, Japan, 223-227, October 1993.

"Learning Algorithms and Network Architectures," (T. Poggio and F. Girosi). In: Exploring Brain Functions: Models in Neuroscience, (Proceedings of the 1991 Dahlem Conference), T. Poggio and D. Glaser (eds.), John Wiley & Sons, New York, NY, 77-96, 1993.

"Progress in Image Understanding at MIT," (W.E.L. Grimson, B.K.P. Horn and the staff of the AI Laboratory). In: Proceedings of the Image Understanding Workshop, Morgan Kaufmann, San Mateo, CA, 69-82, 1992.

"HyperBF Networks for Gender Classification," (R. Brunelli and T. Poggio). In: Proceedings of the Image Understanding Workshop, (IU Meeting in San Diego, CA, January, 1992), Morgan Kaufmann, San Mateo, CA, 311-314, 1992.

"Analog VLSI Systems for Early Vision Processing," (Wyatt, J.L., C. Keast, M. Seidel, D. Standley, B. Horn, T. Knight, C. Sodini, H.-S. Lee and T. Poggio). In: Proceedings of the IEEE International Symposium on Circuits and Systems, San Diego, CA, May 1992.

"A Floor Boundary Sensor for Autonomous Robot Navigation," (P. Bellutta, N. Ancona, and T. Poggio). *IJCAI*, 1991 - in progress.

"Networks that Learn from Examples as a General Tool in the Understanding of Visual Performance," (S. Edelman, T. Poggio and M. Fahle). In: Proceedings of Neural Information Processing Society, December 1991.

"A New Definition of Intelligence"/"Una Nuova Definizione di Intelligenza," (T. Poggio). In: L'Automata Spirituale: Menti, Cervelli e Computer, (Proceedings of the Hypothesis Conference), Luterza, Bari, Italy, 1991.

"Regularization, Radial Basis Functions, and Recent Extensions of Networks for Learning," (F. Girosi and T. Poggio). In: Proceedings of 13th IMACS World Congress on Computation and Applied Mathematics, Trinity College, Dublin, Ireland, July 1991.

"HyberBF Networks for Real Object Recognition," (R. Brunelli and T. Poggio). In: Proceedings of the 12th International Joint Conference on Artificial Intelligence, J. Mylopoulos and R. Reiter (eds.), Morgan Kaufman Publishers, 1278-1284, 1991.

"Extensions of a Theory of Networks for Approximation and Learning: Outliers and Negative Examples," (F. Girosi, T. Poggio and B. Caprile). In: Proceedings Neural Information Processing Society Conference, R. Lippmann, J. Moody and D. Touretzkey, Morgan Kaufmann Publishers, San Mateo, CA, 1991.

"A Nondeterministic Method for Multivariate Functions Minimization," (B. Caprile, F. Girosi) and T. Poggio . In: Proceedings of the Symposium 'Architetture Parallele e Reti Neurali', Vietri sul Mare, Salerno, Italy, May 8-10, 1991.

"Synaptic Computations and a New Approach to Learning," (T. Poggio). In: Proceedings of the 3rd International Symposium on Bioelectronic and Molecular Electronic Devices, R&D Assoc. for Future Electron Devices, Kobe, Japan, December 1990.

"MIT Progress in Understanding Images," (T. Poggio and the staff of the Artificial Intelligence Laboratory). In: Proceedings of the Image Understanding Workshop, L. Bauman (ed.), Science Applications International Corporation, McLean, VA, 19-27, 1990.

"A Theory of How the Brain Might Work," (T. Poggio). In: Proceedings of Cold Spring Harbor Symposia on Quantitative Biology, Cold Spring Harbor Laboratory Press, Cold Spring Harbor, NY, 4, 899-910, 1990.

"Extensions of a Theory of Networks for Approximation and Learning: Dimensionality Reduction and Clustering," (T. Poggio and F. Girosi). In: Proceedings of the Image Understanding Workshop, (IU Workshop, Pittsburgh, PA, September, 1990), L. Bauman (ed.), Science Applications International Corporation, McLean, VA, 597-603, 1990.

"A Model of the Acquisition of Object Representations in Human 3D Visual Recognition," (S. Edelman, D. Weinshall, H.H. Bülthoff and T. Poggio). In: Proceedings of the NATO Advanced Research Workshop on Robots and Biological Systems, Lucca, Italy, 1989.

"Biophysics of Computation," (T. Poggio). In: Neuroscience in the Twenty-First Century: New Perspectives and Horizons, (Proceedings of the Georgetown University Bicentennial Symposium), Fidia Research Foundation, Washington, DC, 58-66, May 1989.

- "MIT Progress in Understanding Images," (T. Poggio and the staff of the Artificial Intelligence Laboratory). In: Proceedings of the Image Understanding Workshop, L. Bauman (ed.), Science Applications International Corporation, McLean, VA, 56-74, 1989.
- "Representations in High-level Vision: Reassessing the Inverse Optics Paradigm," (S. Edelman and T. Poggio). In: Proceedings of the Image Understanding Workshop, L. Bauman (ed.), Science Applications International Corporation, McLean, VA, 944-949, 1989.
- "A Network for Image Segmentation Using Color," (A. Hurlbert and T. Poggio). In: Advances in Neural Information Processing Systems I: Proceedings of the Denver Conference on Neural Networks, D.S. Touretzky (ed.), Morgan Kaufmann Publishers, San Mateo, CA, 297-304, 1989.
- "Parallel Processing of Color in the Vision Machine," (A. Hurlbert and T. Poggio). In: Snowbird Proceedings, April 1989.
- "Labeling of Surface Discontinuities through the Integration of Vision Modules," (D. Weinshall, D. Geiger and T. Poggio). In: IEEE Proceedings of 16th Convention of Electrical and Electronics Engineers in Israel, p. 2.5.1, Tel-Aviv, March 1989.
- "A Parallel Motion Algorithm Consistent with Psychophysics and Physiology," (H.H. Bülthoff, J.J. Little and T. Poggio). In: Proceedings of the Workshop on Visual Motion, March 20-22, 1989, The Computer Society of the IEEE, Washington, DC, 165-172, 1989.
- "Optical Flow: Computational Properties and Networks, Biological and Analog," (T. Poggio, W. Yang and V. Torre). In: The Computing Neuron, (Proceedings of the Neuron as a Computational Unit symposium, King's College, Cambridge, UK, June, 1988), R. Durbin, C. Miall, and G. Mitchison, (eds), Addison-Wesley, Reading, MA, 355-370, 1989.
- "Parallel Optical Flow Using Local Voting," (J. Little, H.H. Bülthoff and T. Poggio). In: Proceedings of International Conference on Computer Vision, Tarpon Springs, FL, December 1988.
- "Learning Lightness Algorithms," (A. Hurlbert and T. Poggio). In: Proceedings of the SPIE, D.P. Casasent (ed.), Cambridge, MA, 242-249, November 1988.
- "Learning a Color Algorithm from Examples," (T. Poggio and A. Hurlbert). In: Neural Information Processing Systems: Proceedings of the Neural Information Processing Conference, American Institute of Physics, New York, 622-631, 1988.
- "Parallel Integration of Vision Modules," (T. Poggio, E. Gamble and J. Little). In: Proceedings 1988 Spring Symposium Series - Physical and Biological Approaches to Computational Vision, AAAI Symposium Series, Stanford, CA, 88-95, 1988.
- "The Vision Machine Project: Integrating Early Vision Modules," (J. Little and T. Poggio). In: Proceedings 1988 Spring Symposium Series - Physical and Biological Approaches to Computational Vision, March 22-24, 1988, AAAI Symposium Series, Stanford, CA, 85-87, 1988.
- "The Vision Machine," (T. Poggio, J. Little, E. Gamble, W. Gillett, D. Geiger, D. Weinshall, M. Villalba, N. Larson, T. Cass, H. Bülthoff, M. Drumheller, P. Oppenheimer, W. Yang and A. Hurlbert). In: Proceedings of the Image Understanding Workshop, L. Bauman (ed.), Science Applications International Corporation, McLean, VA, 1988.
- "MIT Progress in Understanding Images," (T. Poggio and the staff of the Artificial Intelligence Laboratory). In: Proceedings of the Image Understanding Workshop, L. Bauman (ed.), Science Applications International Corporation, McLean, VA, 1988.

"An Optimal Scale for Edge Detection," (D. Geiger and T. Poggio). In: Proceedings of the International Joint Conference on Artificial Intelligence, Milan, Italy, 2, 745-748, August 1987.

"Computer Vision," (T. Poggio). In: Proceedings of SPIE -- Image Pattern Recognition: Critical Review of Technology, SPIE, Bellingham, WA, 1987.

"Qualitative Information in the Optical Flow," (A. Verri and T. Poggio). In: Proceedings of the Image Understanding Workshop, L. Bauman (ed.), Science Applications International Corporation, McLean, VA, 825-834, 1987.

"Against Quantitative Optical Flow," (A. Verri and T. Poggio). In: Proceedings of the First International Conf. on Computer Vision (ICCV), Computer Society Press, Washington DC, 171-180, 1987.

"Understanding the Human Mind through Artificial Intelligence," (T. Poggio). In: Disability Unbound: Proceedings of the Rhode Island Dept. of Mental Health, Retardation and Hospitals Symposium, D.M. Cone and D.P. Galamaga (eds.), Cranston, RI, November, 1987.

"Parallel Optical Flow Computation," (J. Little, H. Bülthoff and T. Poggio). In: Proceedings of the Image Understanding Workshop, L. Bauman (ed.), Science Applications International Corporation, McLean, VA, 915-920, 1987.

"Detecting Blobs as Textons in Natural Images," (H. Voorhees and T. Poggio). In: Proceedings of the Image Understanding Workshop, L. Bauman (ed.), Science Applications International Corporation, McLean, VA, 892-899, 1987.

"Detecting Textons in Natural Images," (H. Voorhees and T. Poggio). In: Proceedings of the First International Conference on Computer Vision, Computer Society Press, Washington, DC, 250-258, 1987.

"MIT Progress in Understanding Images," (T. Poggio and the staff of the Artificial Intelligence Laboratory). In: Proceedings of the Image Understanding Workshop, L. Bauman (ed.), Science Applications International Corporation, McLean, VA, 41-54, 1987.

"Parallel Processes in Early Vision: From the Computational Structure to Algorithms and Parallel Hardware," (T. Poggio). In: Proceedings - Technical Notes, Topical Meeting on Optical Computing, Optical Society of America, Incline Village, Nevada, March 1985.

"MIT Progress in Understanding Images," (T. Poggio and staff of the Artificial Intelligence Laboratory). In: Proceedings of the Image Understanding Workshop, December 9-10, 1985, L. Bauman (ed.), Science Applications International Corporation, McLean, VA, 25-39, 1985.

"Probabilistic Solution of Ill-posed Problems in Computational Vision," (J. Marroquin, S. Mitter and T. Poggio). In: Proceedings of the Image Understanding Workshop, L. Bauman (ed.), Science Applications International Corporation, McLean, VA, 293-309, 1985.

"Fingerprints Theorems," (A.L. Yuille). In: Proceedings National Conference on Artificial Intelligence, AAAI, 362-365, 1984.

"Spatiotemporal Interpolation in Vision," (M. Fahle and T. Poggio). In: Proceedings of the Workshop on Human and Machine Vision, Beck and Rosenfeld (eds.), Academic Press, 365-393, 1984.

"Stereo Vision for Robotics," (H.K. Nishihara and T. Poggio). In: Proceedings of the First International Symposium of Robotics Research, Brady and Paul (eds.), MIT Press, Cambridge, MA, 489-505, 1984.



"Ill-posed Problems and Regularization Analysis in Early Vision," (T. Poggio and V. Torre). In: Proceedings of the Image Understanding Workshop, L. Bauman (ed.), Science Applications International Corporation, McLean, VA, 1984.

"MIT Progress in Understanding Images," (T. Poggio and the staff of the Artificial Intelligence Laboratory). In: Proceedings of the Image Understanding Workshop, L. Bauman (ed.), Science Applications International Corporation, McLean, VA, 1984.

"Low-level Vision as Inverse Optics," (T. Poggio). In: Proceedings of Symposium on Computational Models of Hearing and Vision, M. Rauk (ed.), Academy of Sciences of the Estonian S.S.R., 123-127, 1984.

"Scaling Theorems for Zero Crossings," (A.L. Yuille and T. Poggio). In: Proceedings Workshop on Computer Vision: Representation and Control, April 30-May 2, 1984, IEEE Computer Society, Annapolis, MD, 3-7, 1984.

"MIT Progress in Understanding Images," (T. Poggio, S. Ullman and staff). In: Proceedings of the Image Understanding Workshop, L. Bauman (ed.), Science Applications International Corp., McLean, VA, 11-23, 1983.

"Early Information Processing and Spatiotemporal Interpolation in Human Vision," (T. Poggio). In: De La Physique Theorique à la Biologie, (Proceedings of the 1981 Versailles Conference), Marois (ed.), Institut de la Vie, 1983.

"The Smooth (Fixation and Tracking) Control System," (W. Reichardt and T. Poggio) In : Vision Control of Flight in Flies, 136-210, MIT 1981

"A New Approach to Synaptic Interactions," (T. Poggio and V. Torre). In: Lecture Notes in Biomathematics 21, (Proceedings: Theoretical Approaches to Complex Systems, Tübingen, West Germany), R. Heim and G. Palm (eds.), Springer Verlag, Berlin, 89-115, 1978.

"Nonlinear Interactions Underlying Visual Orientation Behavior of the Fly," (T. Poggio and W. Reichardt). In: Proceedings of Cold Spring Harbor Symposia on Quantitative Biology XL, 635-645, 1976.

"A Non-linear Transfer Function for Some Neuron Models," (T. Poggio). In: Proceedings of the First Symposium on Testing and Identification of Nonlinear Systems, G.D. McCann and P.Z. Marmarelis (eds.), 292-300, 1975.

"On Optimal Discrete Estimation," (T. Poggio). In: Proceedings of the First Symposium on Testing and Identification of Nonlinear Systems, G.D. McCann and P.Z. Marmarelis (eds.), 30-37, 1975.

"Stochastic Linearization, Central Limit Theorem and Linearity in (Nervous) 'Black-Boxes,'" (T. Poggio). In: Atti of III Congresso Nazionale di Cibernetica E Biofisica, (San Morina, Ottobre, 1974), Lito Felici, Pisa, 349-358, 1975.

"Processing of Visual Information in Insections: Outline of a Theoretical Characterization," (T. Poggio). In: Biokybernetik - V, H. Drischel and P. Dettmar (eds.), VEB Gutav Fischer Verlag, Jena, 235-242, 1975.

"Processing of Visual Information in Flies: From a Phenomenological Model Towards the Nervous Mechanisms," (T. Poggio). In: Proceedings of the International Symposium of the Italian Society of Biophysics, A. Vegli (ed.), Camogli, Italy, 217-225, 1973.

"Information Processing in Neural Networks: A Formal Analogy between Holographic Memories and Optomotor Responses," (T. Poggio). In: Biokybernetik - IV, H. Drischel and P. Dettmar (eds.), VEB Gutav Fischer Verlag, Jena, 222-225, 1972.

"Outline of a Model of Spontaneous Fixation of Elementary Patterns by the Visual System of Flies," (T. Poggio). In: Atti del II Congresso Nazionale de Cibernetica, (Casciane Terme 25-27 Ottobre 1972), Lito Felici, Pisa, 141-152, 1972.

"Analogia Formale tra Teoria Optomotoria e Modelli Olografici di Memoria Temporale," (A. Borsellino and T. Poggio). In: Atti de Congresso di Cibernetica, (Casciane Terme 11-13 Ottobre, 1971), Lito Felici, Pisa, 802-808, 1971.

## ABSTRACTS

Meyers, E., Y. Zhang, N. Bichot, S. Chikkerur, T. Serre, T. Poggio, and R. Desimone, "Decoding multiple objects from populations of macaque IT neurons with and without spatial attention.", accepted to Computational Systems Neuroscience, 2010. (poster)

Meyers, E., Y. Zhang, N. Bichot, T. Serre, T. Poggio, and R. Desimone, "The representation of objects in inferior temporal cortex with and without attention", accepted to Society for Neuroscience (SFN), 2010

Meyers, E., Y. Zhang, N. Bichot, T. Poggio, R. Desimone, "Attention's influence on object representations in inferior temporal cortex", accepted to The 7th International Conference on Cognitive Science 2010.

Jhuang, H., E. Garrote, N. Edelman, T. Poggio, A. Steele, and T. Serre, "Vision-Based Recognition of Mice Home-Cage Behaviors", accepted to [VAIB10](#), Istanbul, Turkey

Mutch, J., U. Knoblich and T. Poggio. "A biophysical model of cortical tuning and invariance operations using a transient population code", accepted to COSYNE09

Serre, T., L. Reddy, N. Tsuchiya, T. Poggio, M. Fabre-Thorpe, and C. Koch. "Reading the mind's eye: Decoding object information during mental imagery from fMRI patterns " accepted to COSYNE09

## TECHNICAL REPORTS

Chikkerur, S., C. Tan, T. Serre, and T. Poggio, "An integrated model of visual attention using shape-based features", *CBCL paper #278/CSAIL Technical Report#2009-029*, Massachusetts Institute of Technology, Cambridge, MA, Jun 20, 2009

Caponnetto, A., T. Poggio and S. Smale [On A Model Of Visual Cortex: Learning Invariance And Selectivity From Image Sequences](#), CBCL paper#272/CSAIL Technical Report [#2008-030](#) , Massachusetts Institute of Technology, Cambridge, MA, April 4, 2008

Knoblich, U., J. Bouvrie and T. Poggio. [Biophysical Models of Neural Computation: Max and Tuning Circuits](#), *CBCL paper*, April 20, 2007.

Rifkin, R., J. Bouvrie, K. Schutte, S. Chikkerur, M. Kouh, T. Ezzat and T. Poggio. Phonetic Classification Using Hierarchical, Feed-forward, Spectro-temporal Patch-based Architectures, *CBCL Paper #266/AI Technical Report #2007-007*, Massachusetts Institute of Technology, Cambridge, MA, January, 2007.

Wolf F., T. Poggio, P. Sinah [Human Document Classification Using Bags of Words](#)., *CBCL paper #263/CSAIL Technical Report #2006-054*, Massachusetts Institute of Technology, Cambridge, MA, August 9, 2006.

Yokono, J.J. and T. Poggio. [A Multiview Face Identification Model With No Geometric Constraints](#), *Sony Intelligence Dynamics Laboratories, Inc.* March, 2006.

Hung, C., G. Kreiman, T. Poggio and J. DiCarlo. [Ultra-fast Object Recognition from Few Spikes](#), *CBCL Paper #253*, Massachusetts Institute of Technology, Cambridge, MA, July 2005.

Serre, T., M. Kouh, C. Cadieu, U. Knoblich, G. Kreiman and T. Poggio. [A Theory of Object Recognition: Computations and Circuits in the Feedforward Path of the Ventral Stream in Primate Visual Cortex](#), *CBCL Paper #259/AI Memo #2005-036*, Massachusetts Institute of Technology, Cambridge, MA, October, 2005.

Yokono, J.J. and T. Poggio. [Boosting a Biologically Inspired Local Descriptor for Geometry-free Face and Full Multi-view 3D Object Recognition](#), *CBCL Paper #254/AI Memo #2005-023*, Massachusetts Institute of Technology, Cambridge, MA, July 2005.

Cadiou, C., M. Kouh, M. Riesenhuber and T. Poggio. [Shape Representation in V4: Investigating Position-specific Tuning for Foundary Conformation with the Standard Model of Object Recognition](#), *CBCL Paper #241/AI Memo #2004-024*, Massachusetts Institute of Technology, Cambridge, MA, November, 2004.

Kouh, M. and T. Poggio. [A General Mechanisms for Tuning: Gain Control Circuits and Synapses Underlie Tuning of Cortical Neurons](#), *CBCL Paper #245/AI Memo #2004-031*, Massachusetts Institute of Technology, Cambridge, MA, December 2004.

Kreiman, G., C. Hung, T. Poggio and J. DiCarlo. [Selectivity of Local Field Potentials in Macaque Inferior Temporal Cortex](#), *CBCL Paper #240/AI Memo #2004-020*, Massachusetts Institute of Technology, Cambridge, MA, September, 2004.

Rakhlin, A., S. Mukherjee, and T. Poggio. [On Stability and Concentration of Measure](#), *CBCL Paper 239*, Massachusetts Institute of Technology, Cambridge, MA, June 2004.

Serre, T., L. Wolf and T. Poggio. [A New Biologically Motivated Framework for Robust Object Recognition](#), *CBCL Paper #243/AI Memo #2004-026*, Massachusetts Institute of Technology, Cambridge, MA, November, 2004.

Yokono, J.J. and T. Poggio. [Rotation Invariant Object Recognition from One Training Example](#), *CBCL Paper #238/AI Memo #2004-010*, Massachusetts Institute of Technology, Cambridge, MA, April, 2004.

Yokono, J.J. and T. Poggio. [Evaluation of Sets of Oriented and Non-oriented Receptive Fields as Local Descriptors](#), *CBCL Paper #237/AI Memo #2004-007*, Massachusetts Institute of Technology, Cambridge, MA, March, 2004.

Geiger, G., T. Ezzat and T. Poggio. [Perceptual Evaluation of Video-realistic Speech](#), *CBCL Paper #224/AI Memo #2003-003*, Massachusetts Institute of Technology, Cambridge, MA, February 2003.

Shimizu, H. and T. Poggio. [Direction Estimation of Pedestrian from Images](#), *CBCL Paper #230/AI Memo #2003-020*, Massachusetts Institute of Technology, Cambridge, MA, August 2003.

Giese, M.A. and T. Poggio. [Biologically Plausible Neural Model for the Recognition of Biological Motion and Actions](#), *CBCL Paper #219/AI Memo #2002-012*, Massachusetts Institute of Technology, Cambridge, MA, August 2002.

"Bagging Regularizes," (Poggio, T., R. Rifkin, S. Mukherjee, and A. Rakhlin), *CBCL Paper #214/AI Memo #2002-003*, Massachusetts Institute of Technology, Cambridge, MA, February 2002.

"Biologically Plausible Neural Circuits for Realization of the Maximum Operations," (Yu, A., M.A. Giese and T. Poggio), *CBCL Paper #207/AI Memo #2001-022*, Massachusetts Institute of Technology, Cambridge, MA, September 2001.

"Statistical Learning: Stability is Sufficient for Generalization and Necessary and Sufficient for Consistency of Empirical Risk Minimization," (Mukherjee, S., P. Niyogi, T. Poggio and R. Rifkin), *CBCL Paper #223*, Massachusetts Institute of Technology, Cambridge, MA, December 2002 [January 2004 revision].

Chan, N.T., B. LeBaron, A.W. Lo and T. Poggio. Agent-Based Models of Financial Markets: A Comparison with Experimental Markets, *MIT Sloan Working Paper No. 4195-01*, Social Science Research Network Electronic Library, October 2001.

"Multiclass Classification of SRBCTs," (Yeo, G. and T. Poggio), *CBCL Paper #204/AI Memo #2001-018*, Massachusetts Institute of Technology, Cambridge, MA, August 2001.

"The Audiomomma Music Recommendation System," (Alvira, M., J. Paris and Rifkin, R.), *CBCL Paper #199/AI Memo #2001-012*, Massachusetts Institute of Technology, Cambridge, MA, July 2001.

"b," (Poggio, T., S. Mukherjee, R. Rifkin, A. Rakhlin and A. Ver), *CBCL Paper #198/AI Memo #2001-011*, Massachusetts Institute of Technology, Cambridge, MA, July 2001.

"Experimental Markets for Product Concepts," (N. Chan, E. Dahan, A. Lo and T. Poggio), *CBCL Paper #200/AI Memo #2001-013*, Massachusetts Institute of Technology, Cambridge, MA, July 2001.

"Learning-based Approach to Estimation of Morphable Model Parameters" (V. Kumar and T. Poggio). *AI Memo #1696/CBCL Paper #191*, Massachusetts Institute of Technology, Cambridge, MA, September 2000.

"Feature Selection for Face Detection," (T. Serre, B. Heisele, S. Mukherjee and T. Poggio). *AI Memo #1697/CBCL Paper #192*, Massachusetts Institute of Technology, Cambridge, MA, September 2000.

"People Recognition in Image Sequences by Supervised Learning," (C. Nakajima, M. Pontil, B. Heisele, and T. Poggio). *AI Memo #1688/CBCL Paper #188*, Massachusetts Institute of Technology, Cambridge, MA, June 2000.

"Face Detection in Still Gray Images," (B. Heisele, T. Poggio and M. Pontil). *AI Memo #1687/CBCL Paper #187*, Massachusetts Institute of Technology, Cambridge, MA, May 2000.

"The Individual is Nothing, the Class is Everything: Psychophysics and Modeling of Recognition in Object Classes," (M. Riesenhuber and T. Poggio). *AI Memo #1682/CBCL Paper #185*, Massachusetts Institute of Technology, Cambridge, MA, April 2000.

"A Note On Object Class Representation And Categorical Perception" (M. Riesenhuber and T. Poggio), *AI Memo #1679/CBCL Paper #183*, Massachusetts Institute of Technology, Cambridge, MA, December 1999.

"Support Vector Machine Classification of Microarray Data," (S. Mukherjee, P. .Tamayo, J.P. Mesirov, D. Slonim, A. Verri and T. Poggio). *AI Memo 1676/CBCL Paper #182*, Massachusetts Institute of Technology, Cambridge, MA, December 1999.

"A Trainable Object Detection System: Car Detection in Static Images," (C. Papageorgiou and T. Poggio). *AI Memo #1673/CBCL Paper #180*, Massachusetts Institute of Technology, Cambridge, MA, April 1999.

"Learning-based Approach to Real-time Tracking and Analysis of Faces," (V. Kumar and T. Poggio). *AI Memo #1672/CBCL Paper #179*, Massachusetts Institute of Technology, Cambridge, MA, September 1999.

"Visual Speech Synthesis by Morphing Visemes," T. Ezzat and T. Poggio). *AI Memo #1658/CBCL Paper #173*, Massachusetts Institute of Technology, Cambridge, MA, May 1999.

"A Unified Framework for Regularization Networks and Support Vector Machines," (T. Evgeniou, M. Pontil, and T. Poggio). *AI Memo #1654/CBCL Paper #171*, Massachusetts Institute of Technology, Cambridge, MA, March 1999.

"Information Dissemination and Aggregation in Asset Markets with Simple Intelligent Traders," (N. Chan, B. LeBaron, A. Lo, and T. Poggio). *AI Memo #1646/CBCL Paper #164*, Massachusetts Institute of Technology, Cambridge, MA, 1998.

"Sparse Correlation Kernel Analysis and Reconstruction," (C. Papageorgiou, F. Girosi and T. Poggio). *AI Memo #1635/CBCL Paper #162*, Massachusetts Institute of Technology, Cambridge, MA, 1998.

"Notes on PCA, Regularization, Sparsity and Support Vector Machines," (T. Poggio and F. Girosi). *AI Memo #1632/CBCL Paper #161*, Massachusetts Institute of Technology, Cambridge, MA, 1998.

"Modeling Invariances in Inferotemporal Cell Tuning," (M. Riesenhuber and T. Poggio). *AI Memo 1629/CBCL Paper #160*, Massachusetts Institute of Technology, Cambridge, MA, March 1998.

"Sparse Representations of Multiple Signals," (T. Evgeniou and T. Poggio). *AI Memo 1619/CBCL Paper #156*, Massachusetts Institute of Technology, Cambridge, MA, September 1997.

"Image-Based View Synthesis," (S. Avidan, T. Evgeniou, A. Shashua, and T. Poggio). *AI Memo 1603/CBCL Paper 145*, Massachusetts Institute of Technology, Cambridge, MA, January 1997.

"A Bootstrapping Algorithm for Learning Linear Models of Object Classes," (T. Vetter, M. Jones, and T. Poggio). *AI Memo #1600/CBCL Paper 143*, Massachusetts Institute of Technology, Cambridge, MA, February 1997.

"Comparing Support Vector Machines with Gaussian Kernels to Radial Basis Function Classifiers," (B. Schoelkopf, K. Sung, C. Burges, F. Girosi, P. Niyogi, T. Poggio and V. Vapnik). *AI Memo 1599/CBCL Paper 142*, Massachusetts Institute of Technology, Cambridge, MA, December 1997.

"Model-based Matching by Linear Combinations of Prototypes," (M. Jones and T. Poggio). *AI Memo 1583/CBCL Paper 139*, Massachusetts Institute of Technology, Cambridge, MA, November 1996.

"Model-based Matching of Line Drawings by Linear Combinations of Prototypes," (M. Jones and T. Poggio). *AI Memo 1559/CBCL Paper 128*, Massachusetts Institute of Technology, Cambridge, MA, December 1995.

"Template Matching: Matched Spatial Filters and Beyond," (R. Brunelli and T. Poggio). *AI Memo 1549/CBCL Paper 123*, Massachusetts Institute of Technology, Cambridge, MA, October 1995.

"Face Recognition from One Example View," (D. Beymer and T. Poggio). *AI Memo 1536/CBCL Paper 121*, Massachusetts Institute of Technology, Cambridge, MA, September 1995.

"Spatial Reference Frames for Object Recognition: Tuning for Rotations in Depth," (N.K. Logothetis, J. Pauls and T. Poggio). *AI Memo 1533/CBCL Paper 120*, Massachusetts Institute of Technology, Cambridge, MA, March 1995.

"Linear Object Classes and Image Synthesis from a Single Example Image," (T. Vetter and T. Poggio). *AI Memo 1531/CBCL Paper 119*, Massachusetts Institute of Technology, Cambridge, MA, April 1995.

"Example-based Learning for View-based Human Face Detection," (K.-K. Sung and T. Poggio). *AI Memo 1521/CBCL Paper 112*, Massachusetts Institute of Technology, Cambridge, MA, December 1994.

"View-based Strategies for 3D Object Recognition," (P. Sinha and T. Poggio). *AI Memo 1518/CBCL Paper 106*, Massachusetts Institute of Technology, Cambridge, MA, November 1994.

"Cooperative Physics of Fly Swarms: An Emergent Behavior," (M. Poggio and T. Poggio). *AI Memo 1512/CBCL Paper 103*, Massachusetts Institute of Technology, Cambridge, MA, January 1995.

"Towards an Example-based Image Compression Architecture for Video-conferencing," (S. Toelg and T. Poggio). *AI Memo 1494/CBCL Paper 100*, Massachusetts Institute of Technology, Cambridge, MA, June 1994.

"Viewer-centered Object Recognition in Monkeys," (N.K. Logothetis, J. Pauls and T. Poggio). *AI Memo 1473/CBCL Paper 95*, Massachusetts Institute of Technology, Cambridge, MA, April 1994.

"View-based Models of 3D Object Recognition and Class-specific Invariances," (N.K. Logothetis, T. Vetter, A. Hurlbert and T. Poggio). *AI Memo 1472/CBCL Paper 94*, Massachusetts Institute of Technology, Cambridge, MA, April 1994.

"A Nonparametric Approach to Pricing and Hedging Derivative Securities Via Learning Networks," (J.M. Hutchinson, A. Lo and T. Poggio). *AI Memo 1471/CBCL Paper 92*, Massachusetts Institute of Technology, Cambridge, MA, April 1994.

"Example-based Image Analysis and Synthesis," (D. Beymer, A. Shashua and T. Poggio). *AI Memo 1431/CBCL Paper 80*, Massachusetts Institute of Technology, Cambridge, MA, November 1993.

"Observations on Cortical Mechanisms for Object Recognition and Learning," (T. Poggio and A. Hurlbert). *AI Memo 1404/CBCL Paper 77*, Massachusetts Institute of Technology, Cambridge, MA, December 1993.

"3D Object Recognition: Symmetry and Virtual Views," (T. Vetter, T. Poggio and H. Bülthoff). *AI Memo 1409/CBCL Paper 76*, Massachusetts Institute of Technology, Cambridge, MA, December 1992.

"Priors, Stabilizers and Bias Functions: From Regularization to Radial, Tensor and Additive Splines," (F. Girosi, M. Jones and T. Poggio). *AI Memo 1430/CBCL Paper 75*, Massachusetts Institute of Technology, Cambridge, MA, June 1993.

"Optical Flow from 1D Correlation: Application to a Simple Time-to-Crash Detector," (N. Ancona and T. Poggio). *AI Memo 1375/CBCL Paper 74*, Massachusetts Institute of Technology, Cambridge, MA, October 1993.

"A Novel Approach to Graphics," (T. Poggio and R. Brunelli). *AI Memo 1354/CBIP Paper 71*, Massachusetts Institute of Technology, Cambridge, MA, February 1992.

"Recognition and Structure from One 2D Model View: Observations on Prototypes, Object Classes and Symmetries," (T. Poggio and T. Vetter). *AI Memo 1347/CBIP Paper 69*, Massachusetts Institute of Technology, Cambridge, MA, February 1992.

"Fast Perceptual Learning in Visual Hyperacuity," (T. Poggio, M. Fahle and S. Edelman). *AI Memo 1336/CBIP Paper 68*, Massachusetts Institute of Technology, Cambridge, MA, December 1991.

"Face Recognition: Features versus Templates," (R. Brunelli and T. Poggio). *IRST Technical Report 9110-04*, Istituto per la Ricerca Scientifica e Tecnologica, Trento, Italy, December 1991.

"Exploring Varieties of Perceptual Learning with a Biologically Motivated HyperBF Network Model of Vernier Hyperacuity," (Y. Weiss, S. Edelman, M. Fahle and T. Poggio). *Department of Applied Mathematics & Computer Science Technical Report CS91-21*, Weizmann Institute of Science, Rehovot, Israel, November 1991.

"The First Three Years of the MIT Vision Chip Project -- Analog VLSI Systems for Integrated Image Acquisition and Early Vision Processing," (B.K.P. Horn, H.-S. Lee, T. Poggio, C. Sodini, and J. Wyatt). *VLSI Memo No. 91-645*, Massachusetts Institute of Technology, Microsystems Technology Laboratories, October 1991.

"3D Object Recognition and Prototypes: One 2D View may be Sufficient," *IRST Technical Report 9107-02*, Istituto per la Ricerca Scientifica e Tecnologica, Trento, Italy, July 1991.

"Green Theorems and Qualitative Properties of the Optical Flow," (T. Poggio, A. Verri and V. Torre). *AI Memo 1289/CBIP Paper 67*, Massachusetts Institute of Technology, Cambridge, MA, April 1991.

"Synthesis of Visual Modules from Examples: Learning Hyperacuity," (T. Poggio, M. Fahle and S. Edelman). *AI Memo 1271/CBIP Paper 62*, Massachusetts Institute of Technology, Cambridge, MA, January 1991.

"A Theory of How the Brain Might Work," (T. Poggio). *AI Memo 1253/CBIP Paper 50*, Massachusetts Institute of Technology, Cambridge, MA, December 1990.

"Does Cortical Area MST know Green theorems?" (T. Poggio, A. Verri and V. Torre). *IRST Technical Report 9008-07*, Istituto per la Ricerca Scientifica e Tecnologica, Trento, Italy, August 1990.

"Extensions of a Theory of Networks for Approximation and Learning: Outliers and Negative Examples," (F. Girosi, T. Poggio and B. Caprile). *IRST Technical Report 9005-12*, Istituto per la Ricerca Scientifica e Tecnologica, Trento, Italy, May 1990.

"3D Object Recognition: On a Result of Basri and Ullman," (T. Poggio). *IRST Technical Report 9005-03*, Istituto per la Ricerca Scientifica, Trento, Italy, May 1990.

"Extensions of a Theory of Networks for Approximation and Learning: Dimensionality Reduction and Clustering," (T. Poggio and F. Girosi). *IRST Technical Report 9004-03*, Istituto per la Ricerca Scientifica e Tecnologica, Trento, Italy, April 1990.

"Bringing the Grandmother Back into the Picture: A Memory-based View of Object Recognition," (S. Edelman and T. Poggio). *AI Memo 1181/CBIP Paper 52*, Massachusetts Institute of Technology, Cambridge, MA, April 1990.

"Extensions of a Theory of Networks for Approximation and Learning: Outliers and Negative Examples," (F. Girosi, T. Poggio and B. Caprile). *AI Memo 1220/CBIP Paper 46*, Massachusetts Institute of Technology, Cambridge, MA, July 1990.

"The First Two Years of the MIT Vision Chip Project," (B.K.P. Horn, H.-S. Lee, T. Poggio, C. Sodini, and J. Wyatt). *VLSI Memo No. 90-605*, Massachusetts Institute of Technology, Microsystems Technology Laboratories, 1990.

"A Project for an Intelligent System: Vision and Learning," (T. Poggio and L. Stringa). *IRST Technical Report 9007-11*, Istituto per la Ricerca Scientifica e Tecnologica, Trento, Italy, 1990.

"Networks and the Best Approximation Property," (F. Girosi and T. Poggio). *AI Memo 1164/CBIP Paper 45*, Massachusetts Institute of Technology, Cambridge, MA, October 1989.

"Extensions of a Theory of Networks for Approximation and Learning: Dimensionality Reduction and Clustering," (T. Poggio and F. Girosi). *AI Memo 1167/CBIP Paper 44*, Massachusetts Institute of Technology, Cambridge, MA, April 1990.

"Continuous Stochastic Cellular Automata that have Stationary Distribution and No Detailed Balance," (T. Poggio and F. Girosi). *AI Memo 1168/CBIP Paper 37*, Massachusetts Institute of Technology, Cambridge, MA, June 1993.

"The First Year of the MIT Vision Chip Project," (B.K.P. Horn, H.-S. Lee, T. Poggio, C. Sodini, and J. Wyatt). *VLSI Memo No. 89-555*, Massachusetts Institute of Technology, Microsystems Technology Laboratories, September 1989.

"A Theory of Networks for Approximation and Learning," (T. Poggio and F. Girosi). *AI Memo 1140/CBIP Paper 31*, Massachusetts Institute of Technology, Cambridge, MA, July 1989.

"Visual Integration and Detection of Discontinuities: The Key Role of Intensity Edges," (E. Gamble and T. Poggio). *AI Memo 970/CBIP Paper 27*, Massachusetts Institute of Technology, Cambridge, MA, October 1987.

"Learning a Color Algorithm from Examples," (A. Hurlbert and T. Poggio). *AI Memo 909/CBIP Paper 25*, Massachusetts Institute of Technology, Cambridge, MA, April 1987.

"Motion Field and Optical Flow: Qualitative Properties," (A. Verri and T. Poggio). *AI Memo 917/CBIP Paper 22*, Massachusetts Institute of Technology, Cambridge, MA, December 1986.

"Computations in the Vertebrate Retina: Gain Enhancement, Differentiation, and Motion Discrimination," (C. Koch, V. Torre, and T. Poggio). *AI Memo 914/CBIP Paper 19*, Massachusetts Institute of Technology, Cambridge, MA, September 1986.

"Biophysics of Computation: Neurons, Synapses and Membranes," (C. Koch and T. Poggio). *AI Memo 795/CBIP Paper 8*, Massachusetts Institute of Technology, Cambridge, MA, October 1984.

"Synapses that Compute Motion," (T. Poggio and C. Koch). *AI Memo 973/CBIP Paper 18*, Massachusetts Institute of Technology, Cambridge, MA, June 1987.

"Visual Attention in Brains and Computers," (A. Hurlbert and T. Poggio). *AI Memo 915/CBIP Paper 17*, Massachusetts Institute of Technology, Cambridge, MA, September 1986.

"Spotlight on Attention," (A. Hurlbert and T. Poggio). *AI Memo 817/CBIP Paper 12*, Massachusetts Institute of Technology, Cambridge, MA, April 1985.

"A Generalized Ordering Constraint for Stereo Correspondence," (A. Yuille and T. Poggio). *AI Memo 777/CBIP Paper 5*, Massachusetts Institute of Technology, Cambridge, MA, May 1984.

"An Analog Model of Computation for the Ill-Posed Problems of Early Vision," (T. Poggio and C. Koch). *AI Memo 783/CBIP Paper 2*, Massachusetts Institute of Technology, Cambridge, MA, May 1984.

"Ill-Posed Problems and Regularization Analysis in Early Vision," (T. Poggio and V. Torre). *AI Memo 773/CBIP Paper 1*, Massachusetts Institute of Technology, Cambridge, MA, March 1984.

"A Connection Between GRBF and MLP," (M. Maruyama, F. Girosi and T. Poggio). *AI Memo 1291*, Massachusetts Institute of Technology, Cambridge, MA, March 1992.

"An Optimal Scale for Edge Detection," (D. Geiger and T. Poggio). *AI Memo 1078*, Massachusetts Institute of Technology, Cambridge, MA, September 1988.

"Ill-posed Problems in Early Vision," (M. Bertero, T. Poggio and V. Torre). *AI Memo 924*, Massachusetts Institute of Technology, Cambridge, MA, May 1987.

"Regularization Theory and Shape Constraints," (A. Verri and T. Poggio). *AI Memo 916*, Massachusetts Institute of Technology, Cambridge, MA, September 1986.

"Probabilistic Solution of Ill-Posed Problems in Computational Vision," (J. Marroquin, S. Mitter and T. Poggio). *AI Memo 897*, Massachusetts Institute of Technology, Cambridge, MA, March 1987.

"A Regularized Solution to Edge Detection," (T. Poggio, H. Voorhees and A. Yuille). *AI Memo 833*, Massachusetts Institute of Technology, Cambridge, MA, May 1985.

"The Analysis of Stereopsis," (G. Poggio and T. Poggio). *AI Memo 785*, Massachusetts Institute of Technology, Cambridge, MA, 1983.

"Vision by Man and Machine," (T. Poggio). *AI Memo 776*, Massachusetts Institute of Technology, Cambridge, MA, March 1984.

"On Edge Detection," (V. Torre and T. Poggio). *AI Memo 768*, Massachusetts Institute of Technology, Cambridge, MA, 1985.



"Vertical Image Registration in Stereopsis," (K.R.K. Nielsen and T. Poggio). *AI Memo 743*, Massachusetts Institute of Technology, Cambridge, MA, 1983.

"Hidden Cues in Random-Line Stereograms," (H. K. Nishihara and T. Poggio). *AI Memo 737*, Massachusetts Institute of Technology, Cambridge, MA, August 1983.

"Fingerprints Theorems for Zero Crossings," (A.L. Yuille and T. Poggio). *AI Memo 730*, Massachusetts Institute of Technology, Cambridge, MA, October 1983.

"Scaling Theorems for Zero-Crossings," (A.L. Yuille and T. Poggio). *AI Memo 722*, Massachusetts Institute of Technology, Cambridge, MA, June 1983.

"A Theoretical Analysis of Electrical Properties of Spines," (C. Koch and T. Poggio). *AI Memo 713*, Massachusetts Institute of Technology, Cambridge, MA, March 1983.

"Information Processing in Dendritic Spines," (C. Koch and T. Poggio). *AI Memo 712*, Massachusetts Institute of Technology, Cambridge, MA, March 1983.

"The Computational Problem of Motor Control," (T. Poggio and B. Rosser). *AI Memo 687*, Massachusetts Institute of Technology, Cambridge, MA, May 1983.

"Visual Algorithms," (T. Poggio). *AI Memo 683*, Massachusetts Institute of Technology, Cambridge, MA, May 1982.

"Zero-Crossings and Spatiotemporal Interpolation in Vision: Aliasing and Electrical Coupling between Sensors," (T. Poggio, H.K. Nishihara and K.R.K. Nielsen). *AI Memo 675*, Massachusetts Institute of Technology, Cambridge, MA, May 1982.

"Nonlinear Interactions in a Dendritic Tree: Localization, Timing and Role in Information Processing," (T. Poggio and C. Koch). *AI Memo 657*, Massachusetts Institute of Technology, Cambridge, MA, September 1981.

"Microelectronics in Nerve Cells: Dendritic Morphology and Information Processing," (T. Poggio, C. Koch and V. Torre). *AI Memo 650*, Massachusetts Institute of Technology, Cambridge, MA, October 1981.

"Marr's Approach to Vision," (T. Poggio). *AI Memo 645*, Massachusetts Institute of Technology, Cambridge, MA, August 1981.

"Some Comments on a Recent Theory of Stereopsis," (D. Marr and T. Poggio). *AI Memo 558*, Massachusetts Institute of Technology, Cambridge, MA, July 1980.

"An Information-Processing Approach to Understanding the Visual Cortex," (F.H. Crick, D.C. Marr and T. Poggio). *AI Memo 557*, Massachusetts Institute of Technology, Cambridge, MA, April 1980.

"Evidence for a Fifth, Smaller Channel in Early Human Vision," (D. Marr, E. Hildreth and T. Poggio). *AI Memo 541*, Massachusetts Institute of Technology, Cambridge, MA, August 1979.

"Bandpass Channels, Zero-Crossings and Early Visual Information Processing," (D. Marr, T. Poggio and S. Ullman). *AI Memo 491*, Massachusetts Institute of Technology, Cambridge, MA, September 1978.

"A Theory of Human Stereo Vision," (D. Marr and T. Poggio). *AI Memo 451*, Massachusetts Institute of Technology, Cambridge, MA, November 1977.

"Analysis of a Cooperative Stereo Algorithm," (D. Marr, G. Palm and T. Poggio). *AI Memo 446*, Massachusetts Institute of Technology, Cambridge, MA, October 1977.

"Cooperative Computation of Stereo Disparity," (D. Marr and T. Poggio). *AI Memo 364*, Massachusetts Institute of Technology, Cambridge, MA, June 1976.

["From Understanding Computation to Understanding Neural Circuitry."](#) (D. Marr and T. Poggio). *AI Memo 357*, Massachusetts Institute of Technology, Cambridge, MA, May 1976.