Citation

For outstanding contributions to the establishment of computational neuroscience, and pioneering research ranging from the biophysical and behavioral studies of the visual system to computational theories of vision and learning in humans and machines

Dr. Tomaso Poggio

Position and Organization :

Eugene McDermott Professor
Dept. of Brain and Cognitive Sciences,
McGovern Institute for Brain Research
Computer Science and Artificial Intelligence Laboratory (CSAIL)
Massachusetts Institute of Technology (MIT)

Doctorate: Ph.D. in Theoretical Physics (Univ. of Genoa, 1970)

Date of Birth: September 11, 1947

Brief Biography :

1970 Ph.D. in Theoretical Physics, Univ. of Genoa
1971 Wissenschaftlicher Assistant, Max Planck Institut fur Biologische Kybernetik
1981 Associate Prof., Dept. of Psychology and Artificial Intelligence Laboratory, MIT
1984 Whitaker Prof., Dept. of Brain & Cognitive Sciences and CSAIL, MIT

Main Awards and Honors :

1979 Otto-Hahn-Medal of the Max-Planck-Society
1990 Founding Fellow, American Association of Artificial Intelligence
1992 Max Planck Research Award (with M. Fahle) from the Alexander von Humboldt Foundation, Bonn, Germany
1997 MIT50K Entrepreneurship Competition Award, Imagen (advisor)
1997 Fellow, American Academy of Arts and Sciences
2000 Laurea Honoris Causa, University of Pavia
2003 Gabor Award, International Neural Network Society
2009 Fellow, American Association for the Advancement of Science (AAAS)

Main Achievements :

Tomaso Poggio received his Doctor in Theoretical Physics from the University of Genoa in 1971 and was a Wissenschaftlicher Assistant, Max Planck Institut fur Biologische Kybernetik, Germany from 1972 until 1981 when he became Associate Professor at MIT. Since 2000, He was served as a member of the faculty of the McGovern Institute for Brain Research. He is currently the Eugene McDermott Professor at the Department of Brain and Cognitive Sciences; Co-Director, Center for Biological and Computational Learning and Member of the Computer Science and Artificial Intelligence Laboratory at MIT.

He pioneered models of the fly's visual system and of human stereovision, introduced regularization theory to computational vision, made key contributions to the biophysics of computation and to learning theory, developed an influential model of recognition in the visual cortex.
Dr. Poggio characterized quantitatively the visuo-motor control system in the fly, deriving equations that could predict the fly's tracking and fixation behavior (with Dr. W. Reichardt).
He also modeled the fly's neural circuitry underlying the detection of motion boundaries, connecting it to behaviour and physiology, pioneering normalization circuits, later used for visual cortex.
Dr. Poggio characterized necessary levels of analysis in computational neuroscience and developed stereo algorithms which served as the primary model of stereopsis and as exemplar for other vision algorithms in the field (with Dr. D. Marr). At the biophysical level, Dr. Poggio and coworkers pioneered models suggesting that dendritic trees and synapses have a key computational role, a view now receiving experimental confirmation. At the level of computation, Dr. Poggio introduced regularization theory as a general framework to solve the ill-posed problems of vision.

His most cited papers describe seminal contributions to learning theory where Dr. Poggio developed the mathematics of Regularization Networks. He applied learning techniques to bioinformatics, to computer graphics, computer vision and to neuroscience e.g. to decrypt the neural code in IT.

In the last decade he has worked on a hierarchical extension of learning developing a feedforward quantitative model of visual recognition in the visual cortex which has been a useful tool to drive and interpret several physiological experiments, is consistent with human performance in rapid categorization and suggests novel architectures to the field of computer vision, based on neuroscience of vision.

In recognition of these achievements, Dr. Poggio is an honorary member of the Neuroscience Research Program, a member of the American Academy of Arts and Sciences, a Founding Fellow of AAAI and a Fellow of the American Association for the Advancement of Science. He received several awards such as the Otto-Hahn-Medal of the Max-Planck-Society, the Max Planck Research Award (with M. Fahle), from the Alexander von Humboldt Foundation, the MIT 50K Entrepreneurship Competition Award, the Laurea Honoris Causa from the University of Pavia in 2000 and the 2003 Gabor Award.

For outstanding contributions to the establishment of computational neuroscience, and pioneering research ranging from the biophysical and behavioral studies of the visual system to computational theories of vision and learning in humans and machines, Dr. Tomaso Poggio is hereby awarded the Okawa Prize.