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**From:** Marvin Minsky [REDACTED]  
**Sent:** Tuesday, May 31, 2011 7:09 PM  
**To:** Jeffrey Epstein  
**Subject:** Minsky biography / CV

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#### Brief Academic Biography of Marvin Minsky

Marvin Minsky is Toshiba Professor of Media Arts and Sciences at the Massachusetts Institute of Technology. His research has led to both theoretical and practical advances in artificial intelligence, cognitive psychology, neural networks, and the general theory of computation. (In 1961 he showed that any computer can be simulated by a machine with only two registers and two simple instructions.) He has made many other contributions in the domains of computer graphics, symbolic computation, knowledge representation, commonsense semantics, and both symbolic and connectionist learning. He has also been involved with advanced technologies for exploring space.

Professor Minsky was also a pioneer of robotics and telepresence. He designed and built some of the first visual scanners, and mechanical hands with tactile sensors, along with their software and hardware interfaces. These influenced many subsequent robotic projects.

In 1951 he built the first randomly wired neural network learning -- based on reinforcing the synaptic connections that contributed to recent reactions. In 1956, when a Junior Fellow at Harvard, he invented and built the first Confocal Scanning Microscope, an optical instrument with unprecedented resolution and image quality.

Since the early 1950s, Marvin Minsky has worked on using computational ideas to characterize human psychological processes, as well as working to endow machines with intelligence. His 1961 paper, "Steps Towards Artificial Intelligence" surveyed and analyzed what had been done before, and outlined many major problems that the infant discipline would later need to face. The 1963 paper, "Matter, Mind, and Models" addressed the problem of making self-aware machines. In "Perceptrons," 1969, Minsky and Seymour Papert characterized the capabilities and limitations of loop-free learning and pattern recognition machines. In "A Framework for Representing Knowledge" (1974) Minsky put forth a model of knowledge representation to account for many phenomena in cognition, language understanding, and visual perception. These representations, called "frames," inherited their variable assignments from previously defined frames, and are often considered to be an early form of object oriented programming.

In the early 1970s, Minsky and Papert began formulating a theory which combined insights from developmental child psychology and their experience with research on Artificial Intelligence — a view in which human intelligence comes from the managed interaction of a diverse variety of agencies. They argued that such diversity is necessary because different tasks require fundamentally different mechanisms; this transforms psychology from a fruitless quest for a few "basic" principles into a search for mechanisms that a mind could use to manage the interaction of many diverse elements.

Bits and pieces of this theory emerged in papers through the 70s and early 80s. Papert turned to applying these new ideas to transforming education while Minsky continued to work on "The Society of Mind," a book published in 1985 which 270 interconnected one-page ideas reflect the structure of the theory itself. Each page either proposes one such mechanism to account for some psychological phenomena or addresses a problem introduced by some proposed solution of another page. In 2006, Minsky published a sequel, "The Emotion Machine," which proposes theories that could account for human higher-level feelings, goals, emotions, and conscious thoughts in terms of multiple levels of

processes, some of which can reflect on the others. By providing us with multiple different "ways to think," these processes could account for much of our uniquely human resourcefulness.

## EDUCATION

The Fieldston School, New York.

Bronx High School of Science, New York

Phillips Academy, Andover, Massachusetts United States Navy, 1944-45 B.A. Mathematics Harvard University 1946-50

Ph.D. Mathematics Princeton University 1951-54 Junior Fellow, Harvard Society of Fellows, 1954-1957

## PROFESSIONAL

Toshiba Professor of Media Arts and Sciences, M.I.T, 1990-present Donner Professor of Science, M.I.T., 1974-1989

Professor, Department of Electrical Engineering, M.I.T., 1974 Co-Director, M.I.T. Artificial Intelligence Laboratory, 1959-

1974 Assistant Professor of Mathematics, M.I.T., 1958 Founder, M.I.T. Artificial Intelligence Project, 1959 Staff Member, M.I.T. Lincoln Laboratory, 1957-1958

## HONORS

Turing Award, Association for Computing Machinery, 1970 Doubleday Lecturer, Smithsonian Institution, 1978

Messenger Lecturer, Cornell University, 1979 Dr. Honoris Causa, Free University of Brussels, 1986 Killian Award, MIT,

1989 Japan Prize Laureate, 1990 Research Excellence Award, IJCAI 1991 Joseph Priestly Award, 1995 Rank Prize, Royal

Society of Medicine, 1995 Computer Pioneer Award, IEEE Computer Society, 1995 R.W. Wood Prize, Optical Society of America, 2001 Benjamin Franklin Medal, Franklin Institute, 2001 In Praise of Reason Award, World Skeptics Congress, 2002

## SOCIETIES

President, American Association for Artificial Intelligence, 1981-82 Fellow, American Academy of Arts and Sciences

Fellow, Institute of Electrical and Electronic Engineers Fellow, Harvard Society of Fellows Fellow, CSICOP Board of

Advisors, National Dance Institute Board of Advisors, Planetary Society Board of Governors, National Space Society

Awards Council, American Academy of Achievement Member, U.S. National Academy of Engineering Member, U.S.

National Academy of Sciences Member, Argentine National Academy of Science

## CORPORATE AFFILIATIONS

Director, Information International, Inc., 1961-1984 Founder, LOGO Computer Systems, Inc.

Founder, Thinking Machines, Inc.

Fellow, Walt Disney Imagineering

## INVENTIONS

1951 SNARC: First Neural Network Simulator

1955 Confocal Scanning Microscope: U.S. Patent 3013467

1963 First head-mounted graphical display

1963 Concept of Binary-Tree Robotic Manipulator

1967 Serpentine Hydraulic Robot Arm (MIT Museum of Science)

1970 The "Muse" -- Musical Variation Synthesizer (with E. Fredkin)  
1972 First LOGO "turtle" device (with S. Papert)

## BOOKS

Neural Nets and the Brain Model Problem, Ph.D. thesis, Princeton 1954.  
Computation: Finite and Infinite Machines, Prentice-Hall, 1967.  
Semantic Information Processing, MIT Press, 1968.  
Perceptrons, (with Papert), MIT Press, 1969, 1988 Artificial Intelligence (with Papert) Univ. of Oregon, 1972.  
Robotics, Doubleday, 1986.  
The Society of Mind, Simon and Schuster, 1987.  
The Turing Option, with Harry Harrison, Warner Books, 1992.  
The Emotion Machine. Simon and Schuster, 2006.

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