



ACM A. M. Turing Award: What Is It ?

❖ A. M. Turing Award

- ♦ “The A. M. Turing Award, sometime referred to as the “Nobel Prize” of Computing, was named in honor of Alan Mathison Turing (1912-1954), a British mathematician and computer scientist. He made fundamental advances in computer architecture, algorithms, formalization of computing, and artificial intelligence. Turing was also instrumental in British code-breaking work during World War II.” -- ACM

❖ A. M. Turing Award Recipients (1966-2018)

- ♦ US (53), UK (6), France (3), Norway (2), Netherlands (1), Canada (1), Switzerland (1), China (1), Israel (1), Denmark (1)
- ♦ Male: 67; Female: 3



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Alan Mathison Turing [1912.6.23 - 1954.6.7]



ALAN TURING

Alan Turing was a British mathematician. He is known for his early work on computers and code-breaking. Born in Britain, he served in the British army during the Second World War. As a codebreaker sometimes he is best known for the invention of the Turing machine. This is not a piece of hardware, but a mathematical model of computation. It consists of an infinite tape, a tape read-write head, and a finite-state controller. In each computation step, the controller reads a symbol from the tape, decides whether to move the read-write head one square to the left or right, and then whether to move the read-write head one square up or down. The idea of this abstract computer is that it is both very simple and very powerful!

Turing's work on the theory of computation has had a profound influence on mathematics, philosophy, and computer science. His work on relativity theory and mathematical logic to number theory and the engineering design of mechanical computers. There are numerous published biographies of him, including one by his friend Andrew Hodges, which others calling attention to his sexuality and its impact on his professional career.

The ACM Turing Award is the highest scientific honor in computer science, equivalent to a Nobel Prize in other fields.

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1966, Alan Jay Perlis

- ♦ Citation: For his influence in the area of advanced programming techniques and compiler construction.

♦ Alan Jay Perlis
(Pittsburgh, Pennsylvania, April 1, 1922 – New Haven, Connecticut, February 7, 1990) was a prominent American computer scientist.
He was born in Pittsburgh, Pennsylvania, USA.
He was the first recipient of the Turing Award, in 1966.



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1967, Maurice Vincent Wilkes

- ♦ Citation: Professor Wilkes is best known as the builder and designer of the EDSAC, the first computer with an internally stored program. Built in 1949, the EDSAC used a mercury delay line memory. He is also known as the author, with Wheeler and Gill, of a volume on “Preparation of Programs for Electronic Digital Computer” in 1951, in which program libraries were effectively introduced.

♦ Maurice Vincent Wilkes
(Dudley, England, June 26, 1913 – Cambridge, England, November 29, 2010)
was a British computer scientist, credited with several important developments in computing.



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1968, Richard Wesley Hamming

- ♦ Citation: For his work on numerical methods, automatic coding systems, and error-detecting and error-correcting codes.

♦ Richard Wesley Hamming
(Chicago, February 11, 1915 – Monterey, California, January 7, 1998)
was an American mathematician whose work had many implications for computer science and telecommunications.



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1969, Marvin Lee Minsky

- ♦ **Citation:** The For his central role in creating, shaping, promoting, and advancing the field of Artificial Intelligence.

♦ **Marvin Lee Minsky**
(New York City, August 9, 1927 – Boston, Massachusetts, January 24, 2016)
 was an American scientist in the field of artificial intelligence (AI), co-founder of MIT's AI laboratory, and author of several texts on AI and philosophy.



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1970, James Hardy Wilkinson

- ♦ **Citation:** For his research in numerical analysis to facilitate the use of the high-speed digital computer, having received special recognition for his work in computations in linear algebra and "backward" error analysis.

♦ **James Hardy Wilkinson**
(Strood, England, 27 September 1919 – Teddington, England, 5 October 1986)

was a prominent figure in the field of numerical analysis, a field at the boundary of applied mathematics and computer science particularly useful to physics and engineering.



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1971, John McCarthy

- ♦ **Citation:** Dr. McCarthy's lecture "The Present State of Research on Artificial Intelligence" is a topic that covers the area in which he has achieved considerable recognition for his work.

♦ **John McCarthy**
(Boston, Massachusetts, September 4, 1927 – Stanford, California, October 24, 2011)
 was a prominent computer scientist who was responsible for the coining of the term "artificial intelligence", which he did at the Dartmouth Conference in 1955. McCarthy invented the Lisp programming language and published its design in Communications of the ACM in 1960.



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ACM Turing Award

JOHN McCARTHY

A programming language designer and a central figure in the field of artificial intelligence, John McCarthy had the original idea of AI in the 1940s. He was one of the first to propose the concept of AI in the field. McCarthy participated in the design of Algol 60 and formulated the concept of time sharing in a 1959 memo to the director of the Computation Center at MIT. In 1963, he developed the LISP language, which has been on the faculty ever since.

Throughout his career, McCarthy has advanced using formal logic and mathematics to understand programming languages and systems, as well as in computer science involving other topics, artificial intelligence, and early 2000s work on security issues on which he called a Mathematical Theory of Computation. These identified a number of important concepts in computer science, including the lambda calculus, functional programming, and the LISP language.

Now a lively person with graying hair and beard, McCarthy is an independent researcher who continues to work on his hobbies as well as technical problems. He has won a number of important prizes and honors, including the ACM Turing Award in 1971.



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1972, Edsger Wybe Dijkstra

- ♦ **Citation:** For fundamental contributions to programming as a high, intellectual challenge; for eloquent insistence and practical demonstration that programs should be composed correctly, not just debugged into correctness; for illuminating perception of problems at the foundations of program design.

♦ **Edsger Wybe Dijkstra**
(Rotterdam, Netherlands, May 11, 1930 – Nuenen, Netherlands, August 6, 2002)
 was a Dutch computer scientist and a principal contributor in the late 1950's to the development of the ALGOL, a high level programming language which has become a model of clarity and mathematical rigor. He is one of the principal exponents of the science and art of programming languages in general, and has greatly contributed to our understanding of their structure, representation, and implementation. His fifteen years of publications extend from theoretical articles on graph theory to basic manuals, expository texts, and philosophical contemplations in the field of programming languages.



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EDSGER W DIJKSTRA

A existing and fundamentally warm-hearted person, Edsger W. Dijkstra is known for his clear writing style and his passion for teaching science. He is known for semaphores, which are commonly used in concurrent programming, and for his work on the EWD series of let letters to projects, his "guarded command" language, and methods for reasoning about programs.

Over the years, Dijkstra has written a series of carefully handwritten articles, known commonly as the EWDs. As of the early 2000s, he had written over 1000 such articles, and many of them are available online now on his web page.

He was a strong advocate for the understanding of the mathematical argument to be an increase our powers of reasoning, in particular by the use of formal logic.

His interest in demonstrating mathematical argument is evident in the following quote, each developing an elegant solution to an intriguing problem in a few lines of code:

Like many oldschool Computer, and unlike most Americans, Dijkstra has a fondness for the English language. This is his tribute to Dijkstra, a programming language researcher named Luca Cardelli, who died in 2008. Luca was a friend of mine (2008) and you missed the EWD fest. If you can find the font on the web, you can try writing short notes in Dijkstra's famous handwriting.



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***** Jingde Cheng / SUSTech *****

1973, Charles William Bachman

- ♦ Citation: For his outstanding contributions to database technology.

♦ Charles William Bachman
 (Manhattan, Kansas, December 11, 1924 – Lexington, Massachusetts, July 13, 2017)
 was a prominent computer scientist, particularly in the area of databases.



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***** Jingde Cheng / SUSTech *****

1974, Donald Ervin Knuth

- ♦ Citation: For his major contributions to the analysis of algorithms and the design of programming languages, and in particular for his contributions to the “art of computer programming” through his well-known books in a continuous series by this title.

♦ Donald Ervin Knuth
 (born January 10, 1938, Milwaukee, Wisconsin)
 is a renowned computer scientist and Professor Emeritus at Stanford University.



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1975, Allen Newell, Herbert Alexander Simon

- ♦ Citation: In joint scientific efforts extending over twenty years, initially in collaboration with J. C. Shaw at the RAND Corporation, and subsequently with numerous faculty and student colleagues at Carnegie-Mellon University, they have made basic contributions to artificial intelligence, the psychology of human cognition, and list processing.

♦ Allen Newell
 (San Francisco, March 19, 1927 – Pittsburgh, July 19, 1992) was a researcher in computer science and cognitive psychology. He contributed to the Information Processing Language (1956) and two of the earliest AI programs, the Logic Theory Machine (1956) and the General Problem Solver (1957).



♦ Herbert Alexander Simon
 (Milwaukee, Wisconsin, June 15, 1916 - Pittsburgh, Pennsylvania, February 9, 2001) was a researcher in the fields of cognitive psychology, computer science, economics and philosophy (sometimes described as a polymath).

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1976, Michael Oser Rabin, Dana Stewart Scott

- ♦ Citation: For their joint paper “Finite Automata and Their Decision Problem,” which introduced the idea of nondeterministic machines, which has proved to be an enormously valuable concept. Their (Scott & Rabin) classic paper has been a continuous source of inspiration for subsequent work in this field.

♦ Michael Oser Rabin
 (born Breslau, Germany, September 1, 1931) is an Israeli mathematician and computer scientist.

♦ Dana Stewart Scott
 (born Berkeley, California, October 11, 1932) is the incumbent Hillman University Professor of Computer Science, Philosophy, and Mathematical Logic at Carnegie Mellon University.



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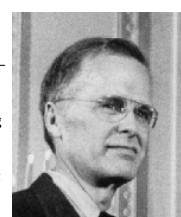
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1977, John Backus

- ♦ Citation: For profound, influential, and lasting contributions to the design of practical high-level programming systems, notably through his work on FORTRAN, and for seminal publication of formal procedures for the specification of programming languages.

♦ John Backus
 (Philadelphia, Pennsylvania, December 3, 1924 – Ashland, Oregon, March 17, 2007) was an American computer scientist, notable as the inventor of the first high-level programming language (FORTRAN), the Backus-Naur form (BNF, the almost universally used notation to define formal language syntax), and the concept of Function-level programming.

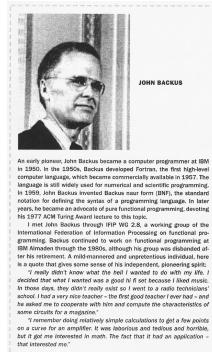


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1978, Robert W. Floyd

- ♦ **Citation:** For having a clear influence on methodologies for the creation of efficient and reliable software, and for helping to found the following important subfields of computer science: the theory of parsing, the semantics of programming languages, automatic program verification, automatic program synthesis, and analysis of algorithms.

♦ **Robert W (Bob) Floyd**
 (New York City, June 8, 1936 –
 Stanford, September 25, 2001)
 was an eminent computer scientist.



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***** Jingde Cheng / SUSTech *****

1980, Charles Antony Richard Hoare

- ♦ **Citation:** For his fundamental contributions to the definition and design of programming languages.

♦ **Charles Antony Richard Hoare (Tony Hoare)**
 (Colombo, Sri Lanka, 11 January 1934)
 is a British computer scientist, probably best known for the development of Quicksort, the world's most widely used sorting algorithm, and perhaps even the world's most widely used algorithm of any kind, in 1960.
 He also developed Hoare logic, and the formal language Communicating Sequential Processes (CSP) used to specify the interactions of concurrent processes and the inspiration for the Occam programming language.



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1981, Edgar F. Codd

- ♦ **Citation:** For his fundamental and continuing contributions to the theory and practice of database management systems.

♦ He originated the relational approach to database management in a series of research papers published commencing in 1970. His paper "A Relational Model of Data for Large Shared Data Banks" was a seminal paper, in a continuing and carefully developed series of papers. Dr. Codd built upon this space and in doing so has provided the impetus for widespread research into numerous related areas, including database languages, query subsystems, database semantics, locking and recovery, and inferential subsystems.

♦ **Edgar F. "Ted" Codd**
 (Fortuneswell, England, August 23, 1923 – Aventura, Florida, April 18, 2003)
 was a British computer scientist who made seminal contributions to the theory of relational databases. While working for IBM, he created the relational model for database management.



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1979, Kenneth Eugene Iverson

- ♦ **Citation:** For his pioneering effort in programming languages and mathematical notation resulting in what the computing field now knows as APL, for his contributions to the implementation of interactive systems, to educational uses of APL, and to programming language theory and practice.

♦ **Kenneth Eugene Iverson**
 (Camrose, Alberta, 17 December 1920 – Toronto, Ontario, October 19, 2004)
 was a Canadian computer scientist most notable for developing the APL programming language.



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ACM Turing Award

TONY HOARE

A brilliant, insatiable person with a twinkle in his eyes, Charles Anthony Richard Hoare began his career in computing in 1960 as a programme designer at the Royal Radar Establishment in Farnborough, England. Professor of Computer Science at the Queen's University in Belfast in 1968 and moved to Oxford University in 1977, Professor Hoare retired from the University of Oxford in 1992. He joined Microsoft Research in 1998, working on the design of the Microsoft Research Lab in Cambridge, U.K. Although he has received many awards, he was knighted by Queen Elizabeth II in 1980. "For his fundamental contributions to the definition and design of programming languages. As the inventor of the first truly practical method for reasoning about programs, clearer algorithms such as Quicksort, data structuring techniques, and the study of monitors. In 1980, he was knighted by Queen Elizabeth II for services to computing." The ACM Turing Award citation continues: "Hoare is the author of the Communicating Sequential Processes (CSP). Along with Miller's Calculus of Communicating Systems, CSP is one of the two most important systems for specifying and analysing certain types of concurrent systems. The standard method for proving properties of imperative programs by using flowcharts and loops is due to Hoare, and is now commonly called Hoare Logic." The photo above shows Tony Hoare and his wife Jill standing outside Buckingham Palace, holding the medal he received when he was knighted by Queen Elizabeth II.

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**1982, Stephen Arthur Cook**

- ♦ **Citation:** For his advancement of our understanding of the complexity of computation in a significant and profound way. His seminal paper, "The Complexity of Theorem Proving Procedures," presented at the 1971 ACM SIGACT Symposium on the Theory of Computing, laid the foundations for the theory of NP-Completeness. The ensuing exploration of the boundaries and nature of NP-complete class of problems has been one of the most active and important research activities in computer science for the last decade.

♦ **Stephen Arthur Cook**
 (Buffalo, New York, December 14, 1939)
 is an American-Canadian computer scientist.



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1983, Kenneth Lane Thompson, Dennis MacAlistair Ritchie

- ♦ **Citation:** For their development of generic operating systems theory and specifically for the implementation of the UNIX operating system.

♦ Kenneth Lane Thompson
(New Orleans, Louisiana, February 4, 1943)
is an American pioneer of computer science notable for his work with the B programming language and his shepherding of the UNIX and Plan 9 operating systems.



♦ Dennis MacAlistair Ritchie
(Bronxville, New York, September 9, 1941 – Berkeley Heights, New Jersey, October 12, 2011)
is an American computer scientist notable for his influence on ALTRAN, B, BCPL, C, Multics, and UNIX.



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1985, Richard Manning Karp

- ♦ **Citation:** For his continuing contributions to the theory of algorithms including the development of efficient algorithms for network flow and other combinatorial optimization problems, the identification of polynomial-time computability with the intuitive notion of algorithmic efficiency, and, most notably, contributions to the theory of NP-completeness. Karp introduced the now standard methodology for proving problems to be NP-complete which has led to the identification of many theoretical and practical problems as being computationally difficult.

♦ Richard Manning Karp
(Boston, Massachusetts, January 3, 1935)
is a computer scientist and computational theorist, notable for research in the theory of algorithms.



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***** Jingde Cheng / SUSTech *****

1987, John Cocke

- ♦ **Citation:** For significant contributions in the design and theory of compilers, the architecture of large systems and the development of reduced instruction set computers (RISC); for discovering and systematizing many fundamental transformations now used in optimizing compilers including reduction of operator strength, elimination of common subexpressions, register allocation, constant propagation, and dead code elimination.

♦ John Cocke
(Charlotte, North Carolina, May 30, 1925 – Valhalla, New York, July 16, 2002)
was an American computer scientist recognized for his large contribution to computer architecture and optimizing compiler design. He is considered by many to be “the father of RISC architecture.”



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***** Jingde Cheng / SUSTech *****

1984, Niklaus Wirth

- ♦ **Citation:** For developing a sequence of innovative computer languages, EULER, ALGOL-W, MODULA and PASCAL. PASCAL has become pedagogically significant and has provided a foundation for future computer language, systems, and architectural research.

♦ Niklaus Wirth
(Winterthur, Switzerland, February 15, 1934)
is a Swiss computer scientist.



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***** Jingde Cheng / SUSTech *****

1986, John Edward Hopcroft, Robert Endre Tarjan

- ♦ **Citation:** For fundamental achievements in the design and analysis of algorithms and data structures.

♦ John Edward Hopcroft
(Seattle, Washington, October 7, 1939)
is a renowned theoretical computer scientist.



♦ Robert Endre Tarjan
(Pomona, California, April 30, 1948)
is a renowned computer scientist.
He is the discoverer of several important graph algorithms, including Tarjan's off-line least common ancestors algorithm.



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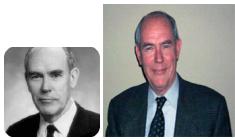
***** Jingde Cheng / SUSTech *****

1988, Ivan Edward Sutherland

- ♦ **Citation:** For his pioneering and visionary contributions to computer graphics, starting with Sketchpad, and continuing after.

♦ Sketchpad, though written twenty-five years ago, introduced many techniques still important today. These include a display file for screen refresh, a recursively traversed hierarchical structure for modeling graphical objects, recursive methods for geometric transformations, and an object oriented programming style. Later innovations include a “Lorgnette” for viewing stereo or colored images, and elegant algorithms for registering digitized views, clipping polygons, and representing surfaces with hidden lines.

♦ Ivan Edward Sutherland
(Hastings, Nebraska, 1938)
is an American computer scientist and the inventor of Sketchpad, an innovative program that influenced alternative forms of interaction with computers.



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***** Jingde Cheng / SUSTech *****

1989, William Velvel Morton Kahan

- ♦ Citation: For his fundamental contributions to numerical analysis. One of the foremost experts on floating-point computations. Kahan has dedicated himself to “making the world safe for numerical computations.”

♦ William Velvel Morton Kahan
(Toronto, Ontario, Canada,
June 5, 1933)
is a Canadian mathematician
and computer scientist.



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1991, Robin Milner

- ♦ Citation: For three distinct and complete achievements: 1) LCF, the mechanization of Scott’s Logic of Computable Functions, probably the first theoretically based yet practical tool for machine assisted proof construction; 2) ML, the first language to include polymorphic type inference together with a type-safe exception-handling mechanism; 3) CCS, a general theory of concurrency. In addition, he formulated and strongly advanced full abstraction, the study of the relationship between operational and denotational semantics.

♦ Arthur John Robin Gorell Milner
(Plymouth, England, January 13,
1934 – Cambridge, England, March 20,
2010)
was a prominent British computer
scientist.



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1992, Butler W. Lampson

- ♦ Citation: For contributions to the development of distributed, personal computing environments and the technology for their implementation: workstations, networks, operating systems, programming systems, displays, security and document publishing.

♦ Butler W. Lampson
(Washington, D.C., December 23,
1943)
is a computer scientist, considered to
be one of the most significant in the
history of computer science.



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1990, Fernando Jose Corbató

- ♦ Citation: For his pioneering work organizing the concepts and leading the development of the general-purpose, large-scale, time-sharing and resource-sharing computer systems, CTSS and Multics.

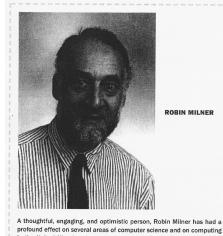
♦ Fernando Jose Corbató
(Oakland, California, July 1, 1926)
is prominent computer scientist,
notable as a pioneer in
the development of
time-sharing
operating systems.



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ACM Turing Award

ROBIN MILNER

A thoughtful, engaging, and optimistic person, Robin Milner has had a profound effect on several areas of computer science and on computing in general. His influence is reflected in the many students he has supervised, open to new ideas, Robin is an unassuming but forceful presence at any discussion, meeting, or workshop presentation.

Milner was awarded the 1995 ACM Turing Award for his “fundamental, distinct and complete achievements: LCF, probably the first theoretically based practical tool for machine assisted proof construction; ML, the first language to include polymorphic type inference and a type-safe exception-handling mechanism; CCS, a general theory of concurrency; and full abstraction, the study of the relationship between operational and denotational semantics.”

After 10 years in Edinburgh, Robin returned to Cambridge University, where he held a Chair in Computer Science and was Head of the Computer Laboratory until his retirement in 1999.



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1993, Juris Hartmanis, Richard Edwin Stearns

- ♦ Citation: In recognition of their seminal paper which established the foundations for the field of computational complexity theory.

♦ Juris Hartmanis
(Riga, Latvia, July 5, 1928)
is a prominent computer scientist
and computational theorist.



♦ Richard Edwin Stearns
(Caldwell, New Jersey, July 5, 1936)
is a prominent computer scientist.



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1994, Edward Feigenbaum, Raj Reddy

- ◆ Citation: For pioneering the design and construction of large scale artificial intelligence systems, demonstrating the practical importance and potential commercial impact of artificial intelligence technology.



Edward Albert Feigenbaum
(Weehawken, New Jersey, January 20, 1936)
is a computer scientist working
in the field of artificial intelligence.

- ◆ Raj Reddy
(Katur, Andhra Pradesh, India,
June 13, 1937)
is an Indian-American computer scientist.

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***** Jingde Cheng / SUSTech *****

1995, Manuel Blum

- ◆ Citation: In recognition of his contributions to the foundations of computational complexity theory and its application to cryptography and program checking.

- ◆ Manuel Blum
(Caracas, Venezuela, 26 April 1938)
is a Venezuelan computer
scientist.



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***** Jingde Cheng / SUSTech *****

1996, Amir Pnueli

- ◆ Citation: For seminal work introducing temporal logic into computing science and for outstanding contributions to program and systems verification.

- ◆ Amir Pnueli
(Nahalal, Israel, April 22, 1941 –
New York, November 2, 2009)
is an Israeli computer scientist.



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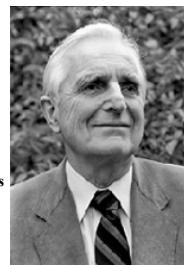
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***** Jingde Cheng / SUSTech *****

1997, Douglas Carl Engelbart

- ◆ Citation: For an inspiring vision of the future of interactive computing and the invention of key technologies to help realize this vision.

- ◆ Douglas Carl Engelbart
(Portland, Oregon, January 30, 1925 –
Atherton, California, July, 2, 2013)
was an American engineer and inventor, and an
early computer and Internet pioneer.
He is best known for inventing the computer
mouse; a pioneer of human-computer
interaction whose team developed hypertext,
networked computers, and precursors to GUIs;
and as a committed and vocal proponent of the
development and use of computers and networks
to help cope with the world's increasingly more
urgent and complex problems (which Horst
Rittel and others called wicked problems).



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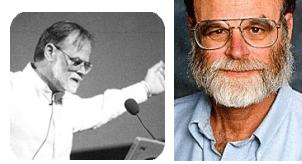
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***** Jingde Cheng / SUSTech *****

1998, James Nicholas Gray

- ◆ Citation: For seminal contributions to database and transaction processing research and technical leadership in system implementation.

- ◆ James Nicholas "Jim" Gray
(San Francisco, California, January 12, 1944,
disappeared at sea January 28, 2007)
was an American computer
scientist.



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1999, Frederick Phillips Brooks, Jr.

- ◆ Citation: For landmark contributions to computer architecture, operating systems, and software engineering.

- ◆ Frederick Phillips Brooks, Jr.
(Durham, North Carolina, April 19, 1931)
is a software engineer and
computer scientist, best-known
for managing the development
of OS/360, then later writing
candidly about the process in
his seminal book The Mythical
Man-Month.



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***** Jingde Cheng / SUSTech *****

2000, Andrew Chi-Chih Yao (姚期智)

- ◆ **Citation:** In recognition of his fundamental contributions to the theory of computation, including the complexity-based theory of pseudorandom number generation, cryptography, and communication complexity.

- ◆ **Andrew Chi-Chih Yao (姚期智)**

(Shanghai, China, December 24, 1946) is a Chinese computer scientist and computational theorist. He completed his undergraduate education in physics at the National Taiwan University, before completing a PhD in physics at Harvard University in 1972, and then a second PhD in computer science from the University of Illinois. He had been a Professor of Computer Science at Princeton University, where he continues to work on algorithms and complexity. In 2004, he became a Professor of Computer Science at Tsinghua University, Beijing, China.



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2002, Ronald L. Rivest, Adi Shamir, Leonard M. Adleman

- ◆ **Citation:** for their ingenious contribution to making public-key cryptography useful in practice.
- ◆ **For seminal contributions to the theory and practical application of public key cryptography.**



(Courtesy of MIT Lab for Computer Science)

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***** Jingde Cheng / SUSTech *****

2001, Ole-Johan Dahl, Kristen Nygaard

- ◆ **Citation:** For ideas fundamental to the emergence of object oriented programming, through their design of the programming languages Simula I and Simula 67.

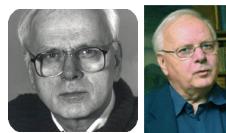
- ◆ **Ole-Johan Dahl**

(Mandal, Norway, October 12, 1931 – Asker, Norway, June 29, 2002) was a Norwegian computer scientist and is considered to be one of the fathers of Simula and object-oriented programming along with Kristen Nygaard.



- ◆ **Kristen Nygaard**

(Oslo, Norway, August 27, 1926 – Oslo, Norway, August 10, 2002) was a Norwegian mathematician, computer programming language pioneer and politician.



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***** Jingde Cheng / SUSTech *****

2003, Alan Curtis Kay

- ◆ **Citation:** For pioneering many of the ideas at the root of contemporary object-oriented programming languages, leading the team that developed Smalltalk, and for fundamental contributions to personal computing.

- ◆ **Alan Curtis Kay**
(Springfield, Massachusetts, May 17, 1940)
is an American computer scientist, known for his early pioneering work on object-oriented programming and windowing graphical user interface design.



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***** Jingde Cheng / SUSTech *****

2004, Vinton Gray Cerf and Robert Elliot Kahn

- ◆ **Citation:** For pioneering work on internetworking, including the design and implementation of the Internet's basic communications protocols, TCP/IP, and for inspired leadership in networking.

- ◆ **Vinton Gray "Vint" Cerf**

(New Haven, Connecticut, June 23, 1943) is an American computer scientist who is the "person most often called 'the father of the Internet'."



- ◆ **Robert Elliot Kahn**

(Brooklyn, New York, December 23, 1938) is an American electrical engineer, who, along with Vinton G. Cerf, invented the Transmission Control Protocol (TCP), and created the Internet Protocol (IP), the fundamental communication protocols at the heart of the Internet.



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2005, Peter Naur

- ♦ **Citation:** For fundamental contributions to programming language design and the definition of Algol 60, to compiler design, and to the art and practice of computer programming.

♦ **Peter Naur**
 (Frederiksberg, Denmark,
 October 25, 1928 –
 Herlev, Denmark, January 3, 2016)
 was a Danish pioneer in computer
 science. His last name is the N
 in the BNF notation
 (Backus-Naur form), used in the
 description of the syntax for most
 programming languages.



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***** Jingde Cheng / SUSTech *****

2007, Edmund M. Clarke, E. Allen Emerson, and Joseph Sifakis

- ♦ **Citation:** For their role in developing Model-Checking into a highly effective verification technology that is widely adopted in the hardware and software industries.



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***** Jingde Cheng / SUSTech *****

2008, Barbara H. Liskov

- ♦ **Citation:** For contributions to practical and theoretical foundations of programming language and system design, especially related to data abstraction, fault tolerance, and distributed computing.

♦ **Barbara H. Liskov**
 (Los Angeles, born November 7, 1939
 as Barbara Jane Huberman)
 is a computer scientist and an Institute
 Professor at the MIT.
 She earned her BA in mathematics at the
 University of California, Berkeley in 1961.
 In 1968 Stanford University made her
 the first woman in the US to be awarded
 a Ph.D. from a computer science
 department.



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***** Jingde Cheng / SUSTech *****

2006, Frances Elizabeth Allen

- ♦ **Citation:** For pioneering contributions to the theory and practice of optimizing compiler techniques that laid the foundation for modern optimizing compilers and automatic parallel execution.

♦ **Frances Elizabeth Allen**
 (Peru, New York, August 4, 1932)
 is an American computer scientist and pioneer
 in the field of optimizing compilers. Her
 achievements include seminal work in compilers,
 optimization, and parallelization. She was the
 first female IBM Fellow. In 2006, she became
 the first woman to win the Turing Award.



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***** Jingde Cheng / SUSTech *****

2007, Edmund M. Clarke, E. Allen Emerson, and Joseph Sifakis

- ♦ **Edmund Melson Clarke, Jr.**
 (July 27, 1945)
 is an American computer scientist. He is the
 FORE Systems Professor of Computer Science
 at Carnegie Mellon University.



- ♦ **Ernest Allen Emerson**
 (Dallas, Texas, June 2, 1954)
 is a computer scientist and endowed professor
 at the University of Texas.



- ♦ **Joseph Sifakis**
 (Heraklion, Greece, December 26, 1946)
 is a Greek computer scientist with French
 citizenship.



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***** Jingde Cheng / SUSTech *****

2009, Charles Patrick Thacker

- ♦ **Citation:** For the pioneering design and realization of the first modern personal computer -- the Alto at Xerox PARC -- and seminal inventions and contributions to local area networks (including the Ethernet), multiprocessor workstations, snooping cache coherence protocols, and tablet personal computers.

♦ **Charles Patrick Thacker**
 (Pasadena, California, February 26,
 1943 – Palo Alto, California,
 June 12, 2017)
 was an American pioneer
 computer designer.



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***** Jingde Cheng / SUSTech *****

2010, Leslie Gabriel Valiant

- ♦ **Citation:** For transformative contributions to the theory of computation, including the theory of probably approximately correct (PAC) learning, the complexity of enumeration and of algebraic computation, and the theory of parallel and distributed computing.

♦ Leslie Gabriel Valiant
 (Budapest, Hungarian Republic, 28 March 1949)
 is a British computer scientist and computational theorist. He is the T. Jefferson Coolidge Professor of Computer Science and Applied Mathematics at Harvard University.



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***** Jingde Cheng / SUSTech *****

2012, Shafi Goldwasser and Silvio Micali

- ♦ **Citation:** For transformative work that laid the complexity-theoretic foundations for the science of cryptography, and in the process pioneered new methods for efficient verification of mathematical proofs in complexity theory.

♦ Shafi Goldwasser
 (New York City, November 14, 1959)
 is American-Israeli computer scientist.
 She is a professor at MIT and the Weizmann Institute of Science, Israel.



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***** Jingde Cheng / SUSTech *****

2014, Michael Ralph Stonebraker

- ♦ **Citation:** For fundamental contributions to the concepts and practices underlying modern database systems.

♦ Michael Ralph Stonebraker
 (Milton, New Hampshire, October 11, 1943)
 is adjunct professor at the MIT CS and AI Laboratory (MIT CSAIL).



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2015, Whitfield Diffie and Martin Hellman

- ♦ **Citation:** For inventing and promulgating both asymmetric public-key cryptography, including its application to digital signatures, and a practical cryptographic key-exchange method

♦ Whitfield Diffie
 (Washington, D.C., June 5, 1944)
 is an American cryptographer.

♦ Martin Hellman
 (New York, October 2, 1945)
 is an American cryptologist and Professor Emeritus of Electrical Engineering at Stanford University.

♦ Diffie and Hellman's groundbreaking 1976 paper, "New Directions in Cryptography," introduced the ideas of public-key cryptography and digital signatures, which are the foundation for most regularly-used security protocols on the Internet today.



***** Jingde Cheng / SUSTech *****

2016, Sir Tim Berners-Lee

- ♦ **Citation:** For inventing the World Wide Web, the first web browser, and the fundamental protocols and algorithms allowing the Web to scale.

♦ **Sir Tim Berners-Lee**
 (London, England, June 8, 1955)
 is an English engineer and computer scientist, best known as the inventor of the World Wide Web.
 He is currently a professor of Computer Science at the University of Oxford and at MIT.



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2017, John Leroy Hennessy and David Andrew Patterson

- ♦ **Citation:** For pioneering a systematic, quantitative approach to the design and evaluation of computer architectures with enduring impact on the microprocessor industry.

♦ John Leroy Hennessy
 (Huntington, New York, September 22, 1952)
 is an American computer scientist. He served as the tenth President of Stanford University.



♦ David Andrew Patterson
 (Evergreen Park, Illinois, November 16, 1947)
 is an American computer pioneer and Pardue Professor Emeritus at UC Berkeley.



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2018, John Leroy Hennessy and David Andrew Patterson

- ♦ **Citation:** For conceptual and engineering breakthroughs that have made deep neural networks a critical component of computing.

♦ Yoshua Bengio
 (Paris, France, 1964)
 is a Professor at the University of Montreal, and the Scientific Director of both Mila (Quebec's Artificial Intelligence Institute) and IVADO (the Institute for Data Valorization).
 ♦ Geoffrey Hinton
 (Wimbledon, London, December 6, 1947)
 is VP and Engineering Fellow of Google, Chief Scientific Adviser of The Vector Institute and a University Professor Emeritus at the University of Toronto.
 ♦ Yann LeCun
 (Sosy-sous-Montmorency, France, July 8, 1960)
 is Silver Professor of the Courant Institute of Mathematical Sciences at New York University, and VP and Chief AI Scientist at Facebook



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2019, ???

- ♦ **Citation:** For ???.



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