

= Alan Kotok =

Alan Kotok (November 9 , 1941 ? May 26 , 2006) was an American computer scientist known for his work at Digital Equipment Corporation (Digital , or DEC) and at the World Wide Web Consortium (W3C) . Steven Levy , in his book Hackers : Heroes of the Computer Revolution , describes Kotok and his classmates at the Massachusetts Institute of Technology (MIT) as the first true hackers .

Kotok was a precocious child who skipped two grades before college . At MIT he became a member of the Tech Model Railroad Club , and after enrolling in MIT 's first freshman programming class , he helped develop some of the earliest computer software including a digital audio program and what is sometimes called the first video game (Spacewar !) . Together with his teacher John McCarthy and other classmates , he was part of the team that wrote the Kotok @-@ McCarthy program which took part in the first chess match between computers .

After leaving MIT , Kotok joined the computer manufacturer DEC , where he worked for over 30 years . He was the chief architect of the PDP @-@ 10 family of computers , and created the company 's Internet Business Group , responsible for several forms of Web @-@ based technology . Kotok is known for his contributions to the Internet and to the World Wide Web through his work at the World Wide Web Consortium , which he and Digital had helped to found , and where he served as associate chairman .

= = Personal life = =

Alan Kotok was born in 1941 in Philadelphia , Pennsylvania , and was raised as an only child in Vineland , New Jersey . During his childhood , he played with tools in his father 's hardware store and learned model railroading . He was a precocious child , skipping two grades at high school , and he matriculated at Massachusetts Institute of Technology (MIT) aged 16 . Although his interest in computers began at Vineland High School , his first practical experience of computing came at MIT ; there he developed a habit of working late at night when more computer time was available .

In 1977 , at age 36 , Kotok married Judith McCoy , a choir director and piano teacher on the faculty of the Longy School of Music . They lived in Cambridge , Massachusetts and Cape May , New Jersey . The couple shared a love of 16th and 17th @-@ century music and pipe organs , and toured historic pipe organs in Sweden , Germany , Italy and Mexico . They had a daughter , Leah Kotok , and two stepchildren from Judith 's prior marriage , Frederica and Daryl Beck .

Kotok recorded an oral history at the Computer History Museum in 2004 . He died at his home in Cambridge , apparently from a heart attack , on May 26 , 2006 , six months after the death of his wife during her treatment for cancer .

= = MIT : 1958 ? 62 = =

At MIT , Kotok earned bachelor 's and master 's degrees in electrical engineering . He was influenced by teachers such as Jack Dennis and John McCarthy and by his involvement in the student @-@ organized Tech Model Railroad Club (TMRC) , which he joined soon after starting college in 1958 .

While a graduate student and member of TMRC , Dennis introduced his students to the TX @-@ 0 on loan to MIT indefinitely from Lincoln Laboratory . In the spring of 1959 , McCarthy taught the first course in programming that MIT offered to freshmen . Outside classes , Kotok , David Gross , Peter Samson , Robert A. Saunders and Robert A. Wagner , all friends from TMRC , reserved time on the TX @-@ 0 . They were able to use the TX @-@ 0 as a personal , single @-@ user tool rather than a batch processing system , thanks to Dennis , faculty advisors and John McKenzie , the operations manager .

In September 1961 , Digital donated a PDP @-@ 1 to MIT . Although not an expensive machine , and with a tiny (by today 's standards) 9K of memory , it had a Type 30 precision CRT display . Dennis oversaw the PDP @-@ 1 lab , located next door to the TX @-@ 0 . Students from TMRC

worked as support staff , programming the new computer .

== = Chess == =

With classmates Elwyn Berlekamp , Michael Lieberman , Charles Niessen and Wagner , Kotok began to develop McCarthy 's IBM 704 chess @-@ playing program in 1959 . Kotok described their work in MIT Artificial Intelligence Project Memo 41 and in his bachelor 's thesis . By the time " the chess group " graduated in 1962 , their program played chess " comparable to an amateur with about 100 games experience " on an IBM 7090 .

Although they came to learn a great deal about the game , neither Kotok nor McCarthy were known as chess players . Mikhail Botvinnik , three times world chess champion , wrote in his book Computers , Chess and Long @-@ Range Planning that the Kotok ? McCarthy program 's " rule for rejecting moves was so constituted that the machine threw the baby out with the bath water . " The program drew criticism from Richard Greenblatt , who later wrote Mac Hack , which beat a person in tournament play , and more recently , from Hans Berliner , when he looked back on it in 2005 . During the Cold War , Kotok @-@ McCarthy played (and lost to) the best Russian chess program in the first match between computer programs .

== = Spacewar ! == =

Martin Graetz , Stephen Russell and Wayne Wiitanen conceived the computer game Spacewar ! while working at Harvard University in 1961 . Inspired by Marvin Minsky 's Three Position Display (which they dubbed the Minskytron) , they had the first version running , with help from their MIT classmates Dan Edwards , Kotok , Stephen D. Piner , Samson and Saunders , by early 1962 . Coded by Russell , Spacewar ! was one of the earliest interactive computer games and is sometimes called the first video game .

Kotok did not write any of the Spacewar ! code , but he did travel to Digital to obtain a sine @-@ cosine routine that Russell needed . Graetz credited Kotok and Saunders with building the game controllers that allowed two people to play side by side .

Spacewar ! has had an enduring legacy . The game 's success was celebrated in Rolling Stone for the game 's 10th anniversary in 1972 in " Spacewar : Fanatic Life and Symbolic Death Among the Computer Bums " . More recently , the source code has been transcribed into a Spacewar ! Java applet , and on the 40th anniversary in 2002 , the creators of Spacewar ! were interviewed by the New York Times .

== = Software == =

Edward Fredkin , at one time at BBN Technologies (BBN) (Digital 's first customer for the PDP @-@ 1) , McCarthy , Russell , Samson , Kotok and Harlan Anderson met in May 2006 for a panel to celebrate the Computer History Museum 's restoration of a PDP @-@ 1 (with Gordon Bell on tape) . Their presentations illustrated the contributions of TX @-@ 0 and PDP @-@ 1 users to early software .

Piner wrote Expensive Typewriter which enabled the group to operate the TX @-@ 0 and PDP @-@ 1 directly .

Wagner wrote Expensive Desk Calculator .

On a second PDP @-@ 1 in the physics department , Daniel L. Murphy wrote the Text Editor and Corrector (TECO) text editor , later used to implement Emacs .

Samson wrote the type @-@ justifying program known as TJ @-@ 2 , an early page layout program , and implemented the War card game .

Collaboration on computing waveforms with Dennis on the TX @-@ 0 led to Samson writing the Harmony Compiler with which PDP @-@ 1 users coded music .

Kotok and Samson worked together on T @-@ Square , a drafting program that used a Spacewar ! controller to move the cursor .

Gross and Kotok built the digital audio program Expensive Tape Recorder .

Early PDP @-@ 1 users wrote programming software including an assembler translated from the TX @-@ 0 over one weekend in 1961 . Kotok later wrote an interpreter for the Lisp programming language in TECO macros .

Kotok and his classmates are described as the first true hackers in the book Hackers : Heroes of the Computer Revolution by Steven Levy .

= = Digital : 1962 ? 96 = =

After graduating from MIT , Kotok started at Digital Equipment Corporation as one of the company 's first few dozen employees ; in his 34 @-@ year career with the company , he held senior engineering positions in storage , telecommunications and software .

He began in 1962 by writing a Fortran compiler for the PDP @-@ 4 , before contributing to the development of the PDP @-@ 5 instruction set . Under Harlan Anderson (Vice President of Engineering) , principal architect Gordon Bell led a team , including Kotok as an assistant logic designer , which developed the first commercial time @-@ sharing computer , the PDP @-@ 6 , designed and delivered in 1963 ? 1964 . Aiming at a scientific market , Digital machines had a 36 @-@ bit word length to accommodate artificial intelligence work in Lisp and to compete with IBM mainframe computers . In 1965 , in what may have been the first around @-@ the @-@ world networking connection , a PDP @-@ 6 at the University of Western Australia in Perth was operated from Boston in the United States via a telex link .

Kotok became the principal architect and designer of several generations of the PDP @-@ 10 , DECsystem @-@ 10 and DECSYSTEM @-@ 20 . Bell , Thomas Hastings , Richard Hill and Kotok wrote that the DECSystem @-@ 10 accelerated the transition from batch @-@ processing to time @-@ sharing and single @-@ user systems . With Kotok as system architect , the VAX 8600 (known as Venus) was introduced in 1984 as the highest @-@ performance computer in Digital 's history to date , operating up to 4 @-@ 2 times faster than the standard at the time .

Kotok expanded his areas of expertise from engineering into teaching and business : following a suggestion of Berlekamp , he taught logic design at the University of California , Berkeley during the 1975 ? 1976 academic year ; he also earned a master 's degree in business administration from Clark University in 1978 , which prepared him for later work at Digital and W3C .

= = Web : 1994 ? 97 = =

While at Digital , Kotok recognized the Web 's potential , and helped to found the World Wide Web Consortium . Early in 1994 , in Zürich , Switzerland , Tim Berners @-@ Lee had met with Michael Dertouzos to discuss starting a new organization at MIT . In April 1994 , Kotok , Steve Fink , Gail Grant and Brian Reid from Digital traveled to CERN in Geneva to speak with Berners @-@ Lee about the need for a consortium to create open standards and coordinate Web development . Berners @-@ Lee mentions the pivotal meeting with Digital in his book Weaving the Web .

As technical director of Digital 's Corporate Strategy Group , Kotok was instrumental in creating the Internet Business Group which advocated early adoption and integration of Internet and Web @-@ based technologies . Digital created the AltaVista search engine , the Internet firewall , the Web portal , the webcast and live election returns . Digital continued its lead in Internet and Web development through difficult times , but Kotok questioned a corporate strategy that he believed consumed Web and Internet resources to sell Digital products like the AlphaServer . For example , he saw a missed opportunity in Millicent , the micropayment system for buying and selling Web content for fractions of a U.S. cent .

Kotok was a corporate consulting engineer for Digital 1962 ? 1997 , W3C Advisory Committee representative for Digital 1994 ? 1996 , vice president of marketing for GC Tech Inc . 1996 ? 1997 , member of the Science Advisory Board for Cylink Corp. , a consultant for Compaq , and a content advisor for the Computer History Museum .

Digital and GC Tech were early W3C members and were among the sponsors of the Fourth

International World Wide Web Conference (WWW4) in 1995 in Boston . Kotok coordinated a birds of a feather meeting on Selection of Payment Vehicle for Internet Purchases on April 7 , 1997 at WWW6 in Santa Clara , California . In La Jolla , California , he presented Micropayment Systems to the Electronic Payments Forum in 1997 .

= = W3C : 1997 ? 2006 = =

Kotok joined W3C as associate chairman in May 1997 . His role involved managing contractual relations with W3C hosts and member organizations , coordinating the worldwide W3C Systems and Web Team services to millions of pages and resources on the W3C website , and maintaining the W3C host site at the MIT Computer Science and Artificial Intelligence Laboratory (CSAIL) , where he was a research scientist .

While he was associate chairman , Kotok was a member of the W3C management team , and worked closely with the W3C Advisory Board . He helped to establish a new W3C office in India and worked with an internal task force to reduce membership fees in developing countries . He was a major contributor to the W3C Patent Policy and chaired Patent Advisory Groups , including one for HTML . He briefly served as Domain Leader of the Technology and Society Domain which at that time included W3C 's activity in digital signatures , electronic commerce , public policy , PICS , RDF metadata , privacy , and security .