

**ENGELBART AND THE DAWN
OF INTERACTIVE COMPUTING**
SRI'S REVOLUTIONARY 1968 DEMO

A 40th Anniversary Celebration

DECEMBER 9, 2008



Doug Engelbart once said, “The better we get, the better we get at getting better.” That concept, combined with his creation of foundational interactive computing technologies, has been a personal inspiration to me. Doug and the members of the Augmentation Research Center at SRI exemplified the disciplined approach to innovation used by SRI researchers today. By focusing on an important problem, capturing the genius of their team, and continuously improving their tools, they accomplished a tour de force unlike any other in the history of computing.

Silicon Valley, the computing industry, and society are indebted to Doug and his team. SRI International is honored to mark the 40th anniversary of the 1968 demo that changed the face of computing—indeed, it changed the world.

Curtis R. Carlson, Ph.D.

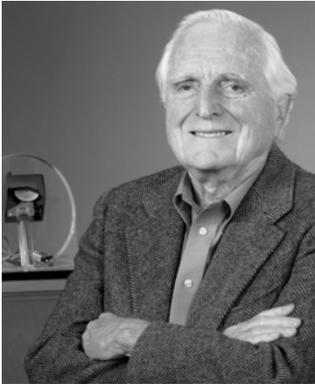
President and CEO

SRI International

PROGRAM

- 1:00 p.m.** **Message from SRI President and CEO Curtis R. Carlson**
- 1:05** **Welcome**
Robert Sproull, Vice President and Fellow, Sun Microsystems
- 1:15** **Introduction**
Charles House, Executive Director, Media X at Stanford University
- 1:30** **Highlights of the 1968 Demo**
- 2:00** **Panel of 1968 Demo Participants**
Moderator: Robert Sproull
SRI principals of the 1968 demo:
- Don Andrews, Vice President, Adobe (retired)
 - William English, Director of Internationalization, Sun Microsystems (retired)
 - Bill Paxton, Senior Fellow, Kavli Institute for Theoretical Physics, University of California, Santa Barbara
 - Jeff Rulifson, Director, VLSI Research Group, Sun Microsystems Laboratories
- Plus a member of the 1968 audience:
- Andries van Dam, Professor of Computer Science, Brown University
- 3:00** **Break**
- 3:20** **Goals and Impact of the Research**
A conversation between Robert W. Taylor, former Program Director, ARPA, and John Markoff, Senior Writer, *The New York Times*
- 3:45** **Surviving in a Global World**
Daniel Borel, Co-founder and Board Member, Logitech
- 4:00** **Driving Vision**
Christina Engelbart, Executive Director, Doug Engelbart Institute
- 4:30** **Significance of the Vision**
Alan Kay, President, Viewpoints Research Institute
- 5:00** **Closing Remarks**
Robert Sproull

DOUGLAS ENGELBART



Dr. Douglas C. Engelbart has an unparalleled 40-year record in predicting, designing, and implementing the future of organizational computing. From his early vision of turning organizations into augmented knowledge workshops, he went on to pioneer what is now known as collaborative computing, hypermedia, knowledge management, community networking, and organizational transformation.

Engelbart's well-known technological firsts include the mouse, display editing, windows, cross-file editing, outline processing, hypermedia, and groupware.

Integrated prototypes were in full operation under the oN-Line System (NLS) as early as 1968. In the last decade of its continued evolution, thousands of users benefited from its unique team support capabilities.

After 20 years directing his own lab at Stanford Research Institute (now SRI International) and 11 years as senior scientist, first at Tymshare, and then at McDonnell Douglas Corporation, Engelbart founded the Doug Engelbart Institute (formerly the Bootstrap Alliance). For more than a decade there, he has worked closely with industry and government stakeholders to launch a collaborative implementation of his work.

Engelbart has received numerous awards for outstanding lifetime achievement and ingenuity, including the National Medal of Technology in 2000, the Lemelson-MIT Prize in 2003, and ACM's 1997 A.M. Turing Award. His life's work, with his big-picture vision and persistent pioneering breakthroughs, has made a significant impact on the past, present, and future of personal, interpersonal, and organizational computing.

BEGINNINGS OF A REVOLUTION

SRI's Augmentation Research Center (ARC) and Dr. Douglas C. Engelbart created many of the concepts and tools that set the global computer revolution in motion.

The first computer mouse was one of many breakthrough innovations originating in the ARC. Engelbart conceived of the mouse in the early 1960s while exploring the interactions between humans and computers. Bill English, then the chief engineer at SRI, built the first prototype in 1964. In 1970, Engelbart received the patent for what was then called the "X-Y Position Indicator for a Display System." For Engelbart, the mouse was one part of a much larger technological system whose purpose was to facilitate organizational learning and global online collaboration.

When Engelbart was a graduate student in electrical engineering, he began to imagine ways in which all sorts of information could be displayed on the screens of cathode ray tubes, and he dreamed of "flying" through a variety of information spaces. In early 1959, he pursued his visionary ideas further into the formulation of a theoretical framework for the co-evolution of human skills, knowledge, and organizations. At the heart of his vision was the computer as an extension of human communication capabilities and a resource for the augmentation of human intellect.

By 1968, Engelbart had formed and was directing SRI's Augmentation Research Center. With this group of young computer scientists and electrical engineers, he staged a 90-minute public multimedia demonstration on December 9, 1968 at the Fall Joint Computer Conference in San Francisco. It was the world debut of personal and interactive computing when a computer mouse controlled a networked computer system to demonstrate hypertext linking, real-time text editing, multiple windows with flexible view control, cathode display tubes, and shared-screen teleconferencing.

It changed what is possible. The 1968 event, which has been called the "mother of all demos," presaged many of the technologies we use today, from personal computing to social networking. The demo embodied Engelbart's vision of solving humanity's most important problems by using computers to improve communication and collaboration.

SPEAKERS



Don Andrews

Vice President (retired)
Adobe

Don Andrews worked with Doug Engelbart in SRI's Augmentation Research Center and was a participant in the 1968 demo. He continued with the Engelbart group as an engineering manager when it moved to Tymshare, Inc., which was acquired by McDonnell Douglas in 1984. In 1985, Andrews went to work for Adobe Systems, where he was later named Vice President of Engineering for the Printing Division. Since leaving Adobe at the end of 1999, he has been semi-retired and pursuing personal projects.



Daniel Borel

*Co-Founder and
Board Member*
Logitech

Daniel Borel co-founded Logitech in 1981. He served on the company's Executive Management Team until 1998, when he retired as CEO to become Chairman of the Board until December 31, 2007. Borel was instrumental in growing Logitech around the world. He established the company's high-volume operations in Asia and took the Logitech Group public on the Swiss stock exchange and on Nasdaq.

Borel holds an engineering degree from the Swiss Federal Institute of Technology Lausanne (Switzerland) and a master's degree in computer science from Stanford University. He serves on the Boards of Directors of Logitech and Nestlé, is on the Board of Defitech Foundation (bringing IT technology to disabled people), and is Chairman of swissUP Foundation (dedicated to the promotion of excellence in education).



Curtis R. Carlson
*President and Chief
Executive Officer*
SRI International

Dr. Curtis R. Carlson became SRI President and CEO in 1998. Previously, he spent more than 20 years with Sarnoff Corporation, a wholly owned SRI subsidiary. As Sarnoff's head of Ventures and Licensing, he helped found more than 12 companies. He also started and helped lead the high-definition television (HDTV) program at Sarnoff that became the U.S. standard and in 1997 won an Emmy® Award for outstanding technical achievement. In 2007, Carlson was named Chairman of Sarnoff's Board of Directors.

In 2006, Carlson co-authored a book, *Innovation: The Five Disciplines for Creating What Customers Want*, which describes how SRI's unique process for innovation can be applied to all types of commercial and nonprofit enterprises, including the government.

Carlson received a B.S. in physics from Worcester Polytechnic Institute and M.S. and Ph.D. degrees in atmospheric physics from Rutgers University.



Christina Engelbart
Executive Director
Doug Engelbart
Institute

Christina Engelbart began her career in 1978 as a customer service and East Coast field representative for early customers of her father Douglas Engelbart's NLS/Augment system, and helped specify the user interface for Augment's hyper-email program. She later joined forces with her father as co-founder and associate director of Bootstrap Institute, working closely together for more than a decade on all aspects of his visionary work. She is now morphing Bootstrap into the Doug Engelbart Institute to carry forward his inspiring legacy and mission.

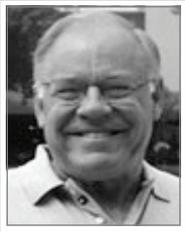
Engelbart received a B.A. with honors in cultural anthropology from the University of California, Berkeley, with a special focus on applied anthropology and organizational behavior. She has also worked in innovation for retail operations and in local economic development.



William English
*Director of
Internationalization
(retired)*
Sun Microsystems

William English graduated from the University of Kentucky in Engineering and earned a Masters in Electrical Engineering from Stanford University. He served in the U.S. Navy Civil Engineering Corp and upon discharge joined Stanford Research Institute (now SRI International), where he collaborated with Doug Engelbart in the early stages of the implementation of Engelbart's Augmented Human Intellect concept. He served as Chief Engineer during development of the Augmentation Research Center (ARC) group at SRI.

English joined Xerox Palo Alto Research Center (PARC) in 1970, where he worked on international versions of the Xerox STAR product. He was later Director of Internationalization at Sun Microsystems.



Charles House
*Executive Director
Media X at Stanford
University*

Charles House is the executive director of Media X, a collaboration bringing together Stanford University's leading interactive technology research with companies committed to technical advancement and innovation. Having participated in creating 12 product lines over a 30-year career at Hewlett-Packard, House led the Intel Research Collaboratory before joining Stanford. He has also been an advisor with 25 startup companies and has been cited by Smithsonian and the Computer History Museum as one of the 200 Computer Wizards of America. He received a BSEE from Caltech and an MA in the history of science and technology from the University of Colorado.



Alan Kay
President
Viewpoints Research
Institute

Alan Kay is one of the earliest pioneers of object-oriented programming, personal computing, and graphical user interfaces. While at the University of Utah in the late 1960s, he invented dynamic object-oriented programming and was part of the original team that developed continuous tone 3D graphics. He was co-designer of the FLEX Machine, an early desktop computer with a graphical user interface. Kay also conceived the “Dynabook,” a laptop personal computer for children of all ages.

He has been a Xerox Fellow, Chief Scientist of Atari, Apple Fellow, Disney Fellow, and HP Senior Fellow. In 2001, Kay founded Viewpoints Research Institute, a nonprofit organization dedicated to children and learning.



John Markoff
Senior Writer
The New York Times

John Markoff joined *The New York Times* in 1988 as a business reporter. Today, as a senior writer based in San Francisco, he writes about computers and technology issues. He also teaches as an adjunct faculty member of Stanford University’s Journalism Department. Markoff previously worked for *The San Francisco Examiner*, the Pacific News Service, *InfoWorld*, and *Byte Magazine*, and was a columnist for *The San Jose Mercury News*.

In 2005, Markoff, a four-time Pulitzer Prize nominee, received the Loeb Award for business journalism with a group of *Times* reporters. In 2007, he was named a fellow of the Society of Professional Journalists, the organization’s highest honor. In 2008, he shared the Society of American Business Editors and Writers Breaking News award. A graduate of Whitman College in Washington, he attended graduate school at the University of Oregon.

Markoff is the co-author of *The High Cost of High Tech* and *Cyberpunk: Outlaws and Hackers on the Computer Frontier*. In 1996 Hyperion published *Takedown: The Pursuit and Capture of America’s Most Wanted Computer Outlaw*, which he co-authored with Tsutomu Shimomura. His most recent book, *What the Dormouse Said: How the Sixties Counterculture Shaped the Personal Computer Industry*, was published in 2005.

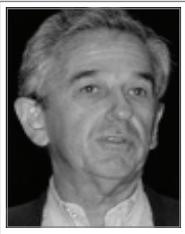


Bill Paxton

*Senior Fellow
Kavli Institute for
Theoretical Physics,
University of California
Santa Barbara*

Bill Paxton worked in SRI's Augmentation Research Center from 1968 to 1977 and was a participant in the 1968 demo. After Paxton received his Ph.D. in computer science from Stanford University, he joined Xerox PARC, which was inventing technologies such as Ethernet, networked personal computers, bitmap displays, and laser printers. At PARC, Paxton worked on early versions of windows-based user interfaces and document editors. In 1983, Paxton joined Adobe to help create the original PostScript technology and later become one of the Adobe recipients of the ACM's Software System Award (1989) for PostScript's design and implementation.

Semi-retired since 1990, Paxton is a Senior Fellow at the University of California, Santa Barbara's Kavli Institute for Theoretical Physics.



Jeff Rulifson

*Director, VLSI
Research Group
Sun Microsystems*

Jeff Rulifson worked in SRI's Augmentation Research Center and was a participant in the 1968 demo. Rulifson directs the VLSI (Very-Large-Scale Integration) Research Group at Sun Microsystems Laboratories, the research division of Sun Microsystems, Inc. He is also President of the Board of Directors of the Doug Engelbart Institute, a cooperative dedicated to the improvement of individual, team, and organizational performance in collaborative settings.

Rulifson came to Sun from Syntelligence, where he was manager of banking products. Before that, he held management positions at ROLM Corporation and Xerox PARC.

Rulifson has a Ph.D. in computer science from Stanford University and is a Fellow of the Association for Computing Machinery (ACM). He received, with Doug Engelbart and Bill English, the ACM's Software System Award in 1990 for pioneering work on augmenting human intellect with hypertext, outline processors, and video conferencing that was implemented in the oN-Line System.



Robert Sproull

*Vice President
and Fellow*
Sun Microsystems

Robert Sproull founded and has led the Massachusetts branch of Sun Microsystems Laboratories for more than 10 years. Since his undergraduate days, Sproull has been building hardware and software for computer graphics and has been involved in VLSI (Very-Large-Scale Integration) design, especially of asynchronous circuits and systems. Before joining Sun in 1990, he was a principal with Sutherland, Sproull & Associates, an associate professor at Carnegie Mellon University, and a researcher at Xerox PARC.

Sproull is author of the recently published book *Logical Effort*, is a member of the National Academy of Engineering, a Fellow of the American Academy of Arts and Sciences, and has served on the U.S. Air Force Scientific Advisory Board.



Robert W. Taylor

*Founding Director
(retired)*
Digital Equipment
Corporation's
System Research
Center

Robert W. Taylor received the National Medal of Technology in 1999 for “visionary leadership in the development of modern computing technology.” In 2004, the National Academy of Engineering awarded Taylor the Draper Prize for the “vision, conception, and development of the principles for, and their effective integration in, the world’s first practical networked personal computers”.

From 1961 to 1965, Taylor was a program manager for the NASA Headquarters Office of Advanced Research and Technology. While there, he provided very early and significant funding to SRI’s Augmentation Research Center. From 1965 to 1969, Taylor was director of the U.S. Department of Defense Advanced Research Projects Agency (ARPA) computer research program, which funded most of the U.S. computer systems research at the time.

In 1970, he started the Xerox PARC Computer Science Laboratory, from which came innovations such as the first distributed, personal computing system; the Ethernet; a networked personal workstation with a graphical user interface; the WYSIWYG editor; and the laser printer. Taylor retired in 1996 as founding director of Digital Equipment Corporation’s System Research Center.



Andries van Dam

Thomas J. Watson, Jr.
University Professor
of Technology
and Education and
Professor of
Computer Science
Brown University

Andries van Dam has been a member of Brown's faculty since 1965, was a co-founder of Brown's Computer Science Department and its first Chairman from 1979 to 1985, and was also Brown's first Vice President for Research from 2002 to 2006. His research includes computer graphics, hypermedia systems, post-WIMP user interfaces including pen-centric computing, and educational software. He has been working for over four decades on systems for creating and reading electronic books with interactive illustrations for use in teaching and research.

He is the co-author of nearly a dozen books, including *Computer Graphics: Principles and Practice* and *Object-Oriented Programming in Java*. He received a B.S. with honors in engineering sciences from Swarthmore College and a Ph.D. from the University of Pennsylvania. In 1967 he co-founded ACM SIGGRAPH (the precursor of SIGGRAPH) and from 1985 through 1987 was Chairman of the Computing Research Association. He is a Fellow of ACM, IEEE, and AAAS; is a member of the National Academy of Engineering and the American Academy of Arts and Sciences; and has received honorary doctorates from Darmstadt Technical University, Swarthmore College, and the University of Waterloo.

ABOUT SRI INTERNATIONAL

Silicon Valley-based SRI International is one of the world's leading independent research and technology development organizations. SRI, which was founded by Stanford University as Stanford Research Institute in 1946 and became independent in 1970, has been meeting the strategic needs of clients and partners for more than 60 years.

Perhaps best known for its invention of the computer mouse and interactive computing, SRI has also been responsible for major advances in networking and communications, robotics, drug discovery and development, advanced materials, atmospheric research, education research, economic development, national security, and more.

The nonprofit institute performs sponsored research and development for government agencies, businesses, and foundations. SRI also licenses its technologies, forms strategic alliances, and creates spin-off companies. In 2007, SRI's consolidated revenues, including its wholly owned for-profit subsidiary, Sarnoff Corporation, were approximately \$450 million.

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