Authors

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Dr. Bleher graduated as Diplomingenieur in 1958 and as Doktor-Ingenieur in electrical engineering in 1966 from Stuttgart Technical University. From 1959 to 1963 he worked there as a scientific associate in low-temperature semiconductor research. As an assistant professor at Aachen Technical University, he was involved in electrodynamic theory and integrated circuit design and technology from 1963 to 1968. Joining IBM in 1968, he held a number of technical and managerial positions in the fields of semiconductor and LSI development. At IBM's Component Division in East Fishkill, New York, he was manager of Advanced Memory Devices from 1969 to 1970. Returning to Boeblingen, he was manager of Circuit Technology and of Printer Electronics. Since 1973, Dr. Bleher has been manager of Advanced Technology Systems, responsible for advanced low-end processor development and advanced application system design. He is also managing System Structure Technology—Group Technical Assignment for the IBM Data Processing Group. He lectured on integrated circuit fundamentals at Aachen Technical University from 1975 to 1978.

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Mr. Burchi joined IBM in 1962 as an electrical engineer at the Glendale Laboratory in Endicott. He designed digital circuitry and taught a digital circuit design course. Mr. Burchi became a Systems Engineer in Detroit in 1964 and was involved with a joint IBM-customer project to develop an advanced graphics system. This led to the development of an OS-based virtual storage system by 1968. He became a Systems Engineering Manager for the project in 1969. Mr. Burchi joined the Data Processing Division Headquarters in 1970 and was the product administrator for OS/VS2 (SVS and MVS). In 1977, he joined the staff of the Systems Research Institute, where he teaches courses in operating system structure, interactive computer graphics, human factors, and financial planning. Mr. Burchi received the B.S. and M.S. degrees in electrical engineering from Wayne State University. He is a member of the ACM and the IEEE.

Eric D. Carlson

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Since joining IBM in 1972, Dr. Carlson has been doing research on improved hardware and software support for interactive applications. In 1976 he received an Outstanding Contribution Award for his work on the Geo-data Analysis and Display System (GADS). He is currently manager of interactive business applications. Dr. Carlson received his Ph.D. degree in Computer Science from the University of North Carolina.

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Mr. Caspers graduated as Diplomingenieur in chemical engineering at the Karlsruhe Technical University in 1957. He spent two years with Werner and Pfleiderer, Stuttgart, West Germany, in the field of control engineering and joined IBM in 1959. He was involved in architecture development and system programming of the System/360 Model 20 and was responsible for its RPG compilers. He held several managerial and technical positions in laboratory communications, software reliability, microprogramming, and advanced system development. Mr.

Caspers currently is an advisory engineer in the Advanced Technology Systems Department and works on graphic system program development and on system structure and performance analysis. Since 1969 he has lectured at the Karlsruhe and the Darmstadt Technical Universities on operating systems and implicit programming languages.

Gary M. Giddings

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Dr. Giddings was a staff member of the IBM Research Laboratory in San Jose, California, from 1967 to 1979, doing research on interactive graphics systems and application design. He was active in both hardware and software fields, using computer graphics to enhance man-computer communication. Dr. Giddings is currently an employee of DiscoVision Associates, a partnership between IBM and MCA. He received his B.S., M.S., and Ph.D. degrees from the Department of Electrical Engineering and Computer Science, University of California, Berkeley.

Sigmund W. Handelman

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Mr. Handelman is a staff programmer in the graphic subsystems group at the IBM Thomas J. Watson Research Center. At present he is developing software packages for hard copy text and graphics. Before joining this group, Mr. Handelman was a special research associate working under IBM Fellow Benoit B. Mandelbrot, and assisted in the production of Mandelbrot's book, *Fractals: Form, Chance, and Dimension*. Mr. Handelman received a B.A. in physics from Yeshiva University in New York City in 1970, and has done graduate work in physics. He has taught computer science at Baruch College, also in New York City, and currently teaches at Queens College of the City University of New York.

Horst H. Henn

IBM Germany, System Products Division, Boeblingen, Germany

Dr. Henn joined IBM Germany in 1975 and was involved in graphic system analysis and design. He recently spent two years on an international assignment at the IBM Thomas J. Watson Research Center in Yorktown Heights, New York, working in the fields of high-speed computer design, computer graphics, and design automation. He is now a staff engineer in the Advanced Technology Systems Department, participating in advanced low-end system design and implementation. Dr. Henn graduated as Diplomingenieur in 1969 and as Doktor-Ingenieur in electrical engineering in 1975 from Stuttgart University, where he was an assistant professor from 1970 to 1974. His specialties also include semiconductor technology and very large scale integration.

Alan L. Jones

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Dr. Jones is a senior engineer in the Graphics Applications Department in the Endicott laboratory. He joined IBM in 1963 in the Mathematical Sciences Technology Department after receiving his B.S. and M.S. degrees in engineering science and engineering mechanics, respectively, from the Pennsylvania State University and his Ph.D. in general engineering from Purdue University. He played a key role in the development of IBM's blood processing products. Dr. Jones is currently engaged in activities related to computer graphics applications and image processing and reproduction. He is a coauthor of APL GRAPHPAK.

Kurt Maerker

IBM Germany, System Products Division, Boeblingen, Germany

Mr. Maerker is a staff engineer in the Advanced Technology Systems Department. He joined IBM in 1969 and worked in system analysis and control structure design and simulation for low-end System/370 mainframes. He has participated in the early development of LSI system components at IBM. In 1973, he began a two-year international assignment at the IBM Thomas J. Watson Research Center in Yorktown Heights, New York, where he was involved in basic user interface definition and relational data base development for small computer systems. Returning to Boeblingen in 1975, he was responsible for graphic system structure design and program implementation. He presently works at the IBM Germany Program Product Development Center on graphic software design. Mr. Maerker graduated as Diplomingenieur in electrical engineering from Darmstadt Technical University in 1969.

David F. McManigal

Data Systems Division, Poughkeepsie, New York

Mr. McManigal joined IBM in 1960 as a systems test technician in the Poughkeepsie manufacturing plant. Later he worked as a programmer for three years in the IBM Boulder, Colorado programming center. Mr. McManigal returned to Poughkeepsie in 1968 and participated in the development of OS/360 TSO and MVS. Since 1973, he has been a member of the team that designed the prototype of the IBM 3277 Graphics Attachment, for which he received a DSD Divisional Award in 1979.

Walter H. Niehoff

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Mr. Niehoff is manager of the Graphics Applications Department in the Endicott laboratory, where he is responsible for applying computer graphics to help meet the objectives of the laboratory. He joined IBM in 1960 after receiving his B.S. degree in electrical engineering from the Pennsylvania State University. After returning for his M.S. in engineering mechanics in 1963, he continued in engineering assignments at the Endicott laboratory. Mr. Niehoff has been a member of the adjunct faculty at the School of Advanced Technology, State University of New York at Binghamton and a Visiting Fellow in the Sibley School of Mechanical and Aerospace Engineering, Cornell University. He is a Registered Professional Engineer in New York. He is a coauthor of APL GRAPHPAK.

Frank P. Palermo

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Prior to joining IBM in 1960, Dr. Palermo taught mathematics at Princeton University, Brown University, and the University of Michigan from 1952 to 1960. In 1960, he joined the applied mathematics group of the Advanced Systems Development Division in Los Gatos, California. Since then he has worked in many areas, including network optimization, algebraic coding theory, hybrid computing, remote computing systems, traffic control, and business simulation and modeling. Dr. Palermo also worked on database search problems, and he implemented an APL workspace for testing and experimenting with the relational operators and the relational calculus. This work resulted in a field developed program, APL Data Language, for use in small databases based on relational concepts. Most recently he has been working in interactive graphics, where he participated in the development of the Picture Building System at the IBM Research Laboratory at San Jose. He is currently a member of the Graphic Application Development Department at the GPD Santa Teresa Laboratory. Dr. Palermo received his Ph.D. in mathematics from Brown University in algebraic topology.

Barry J. Shepherd

General Products Division, Santa Teresa Laboratory, San Jose, California

Dr. Shepherd joined IBM as a staff programmer in the Information Marketing Division in San Jose, California, in 1968. He soon transferred to the Advanced Systems Development Division in Los Gatos, California, to continue his pre-IBM career in computer graphics and display system implementation. A series of projects involving microcoded control, functional specifications, architecture, and economics of various displays followed. He is currently a member of a graphics support group. Dr. Shepherd is a senior member of the IEEE and a founding officer of the National Computer Graphics Association. He is an IBM SHARE graphics project representative and is on the ANSI X3H3 Graphic Standards Project. Dr. Shepherd received a B.A. in physics from the University of British Columbia in 1960 and the M.S. and Ph.D. degrees in nuclear physics from the University of Washington in 1963 and 1965, respectively.

David A. Stevenson

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Mr. Stevenson is a senior engineer on the staff of IBM Fellow William F. Beausoleil, and is currently engaged in the architecture and development of advanced interactive graphics workstations. He joined IBM in 1956 at Poughkeepsie, New York, in the Special Engineering Products Division. In 1964 he was appointed project coordinator for OS/360 BPAM and CATALOG development, for which he received an Outstanding Contribution Award. Numerous other programming assignments followed until he joined Mr. Beausoleil's staff in 1976. He received a DSD Division Award in 1979 for his work on the IBM 3277 Graphics Attachment. Mr. Stevenson has a B.S. in electrical engineering from Indiana Institute of Technology and an M.S. in electrical engineering from Syracuse University.

Daniel L. Weller

Research Division, San Jose, California

Dr. Weller joined the IBM Research Laboratory at San Jose, California, in 1975 as a Research Staff Member. Since that time, he has been working in the areas of graphics and database support for application development. He participated in the design and implementation of the Picture Building System. Dr. Weller received a B.S. degree in electrical engineering from Bucknell University in 1969. He received his M.S. degree in computer science from the University of Michigan in 1970. He then worked at the Bell Telephone Laboratories for a year and a half on computer graphics systems before returning to school for his Ph.D. Dr. Weller received his Ph.D. degree from Stanford University in 1976 in electrical engineering and computer science.

Robin Williams

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Dr. Williams joined IBM at the Thomas J. Watson Research Center at Yorktown Heights, New York, in December 1972. Prior to joining IBM, he had been an Instructor and Assistant Professor at New York University from 1967 to 1972. He transferred to the Research Laboratory at San Jose, California, where he helped develop a color graphics terminal and began the project that developed the Picture Building System that provides database support for building interactive graphics systems. Currently, Dr. Williams is manager of the database and distributed systems department in the San Jose Research Laboratory. He earned a B.Sc. at Imperial College, London, and an M.Sc. and Ph.D. at New York University. Dr. Williams has given numerous talks, published twenty-two technical papers, and has frequently participated in technical conferences. He was chairman of ACM SIGGRAPH 75-77.

Stephen N. Zilles

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In 1963, Mr. Zilles joined IBM in Cambridge, Massachusetts, where he worked on the compilation of PL/I, CS/I (an interactive system for building large programs), and FORMAC (a system for algebraic manipulation). He is currently a Research Staff Member at the IBM Research Laboratory at San Jose, California. In 1970, he was made Advanced Programming Manager, responsible for implementing a prototype high-level machine language interpreter. From 1971 to 1974 he was involved in the design and evaluation of programming and command languages. This work led to an investigation of data abstractions and the semantics of data types. In this context, he developed an algebraic specification technique for abstract data types. In addition, Mr. Zilles collaborated with B. Liskov at MIT on the design of the programming language CLU that allows the programmer to directly represent and manipulate abstract data objects. In late 1974, he joined the IBM Research Division in the Decision Support Systems project, where he worked on an architecture for systems that support the solving of business problems interactively. Since 1978, Mr. Zilles has expanded that work to include interactive business systems in general, working first on TELL (a graphical language and editor for describing such systems), and then on IBA (an interactive environment for developing application programs). Mr. Zilles is the past Chairman of the ACM Special Interest Group on Programming Languages (SIGPLAN), and he has been active on various ACM committees and boards. He has two B.S. degrees, an M.S. and an E.E. degree from the Massachusetts Institute of Technology.