Authors

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Dr. Chang is a senior systems engineer in an economic research department where he is involved with the study of computer system performance and data processing economics. After joining IBM in 1963 he worked for two years in Kingston on the design and analysis of computer-based communications systems. From 1965 to 1968 he was on an IBM fellowship doing graduate studies at Yale University in the area of statistical communications and adaptive controls. From 1968 to 1973 he worked at the Thomas J. Watson Research Center, Yorktown Heights, on system evaluation methodology and the development of advanced concepts for data base/data communication systems. He was an adjunct lecturer teaching digital computer engineering and communication theory at New York University and at the University of Connecticut from 1969 to 1972. He received the B.S. degree from the National Taiwan University in 1960; and the M.S. and Ph.D. from Yale University in 1966 and 1968, all in electrical engineering.

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Dr. Chiu, since joining IBM at the Thomas J. Watson Research Center in 1974, has been working on system measurement and performance analysis. His education includes B.S., M.S., and Ph.D. degrees in electrical engineering and computer science, which he received from the University of California at Santa Barbara in 1968, 1970, and 1973, respectively. He is a member of Eta Kappa Nu, the Association for Computing Machinery, and the Institute of Electrical and Electronics Engineers.

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Dr. Chow is a member of the Computer Science Department at the Thomas J. Watson Research Center, where he joined IBM in November 1973. His current technical interests include computer system queuing theory and combinatorial optimization. Dr. Chow received a B.S. in business administration from Cheng Kung University, Taiwan, in 1966, an M.S. in applied mathematics from Washington University, St. Louis, in 1970, and a Ph.D. in operations research from the University of California, Berkeley, in 1973.

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Dr. Ferrari is an Assistant Professor of Electrical Engineering and Computer Sciences at the University of California at Berkeley, where he does research in the areas of computer system performance evaluation, measurement, workload characterization, and program behavior, and teaches courses in computer organization and performance evaluation. Before taking his present post in 1970, he was an Assistant Professor at the Polytechnic Institute of Milan, Italy. He received a Dr. Ing. degree in electronic engineering from the Polytechnic Institute of Milan in 1963 and the Libera Docenza in computer science and engineering in 1969. Dr. Ferrari is a member of the Association for Computing Machinery and the Institute of Electrical and Electronics Engineers.

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Professor Freiberger has been associated with Brown University since 1956. He was appointed Professor of Applied Mathematics in 1963 and has been Director of the Center for Computer and Information Sciences since 1969 and of Academic Computing Services since 1973. He received his B.A. and M.A. degrees in mathematics at the University of Melbourne, Australia, and his Ph.D. at the University of Cambridge, England. Before going to Brown University, Dr. Freiberger was a Senior Scientific Research Officer at the Aeronautical Research Laboratories, Melbourne, and held a Guggenheim Fellowship (1962-63) at the Institute of Mathematical Statistics of the University of Stockholm. He is a member of Sigma Xi, the Institute of Mathematical Statistics, the American Mathematical Society, The Association for Computing Machinery, and the Society for Industrial and Applied Mathematics, and is an (elected) member of the International Association for Statistics in the Physical Sciences. Dr. Freiberger is also managing editor of the *Quarterly of Applied Mathematics* and has coauthored and edited several books on computational and applied mathematics.

Ulf Grenander

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Since 1966 Dr. Grenander has been L. Herbert Ballou University Professor and Professor of Probability and Statistics in the Division of Applied Mathematics, where his current interest is the construction of a comprehensive theory of patterns to provide a unified approach to the field of pattern analysis and recognition. After receiving his Ph.D. at the University of Stockholm, he taught at several universities—Chicago, California (Berkeley), Stockholm, and Brown. In 1958 he was again at the University of Stockholm where he was also Director of the Institute of Insurance Mathematics and Mathematical Statistics. From 1971-1973 he was also Scientific Director of the Swedish Institute of Applied Mathematics, which he founded, and held a chair of applied mathematics at the Royal Institute of Technology, Stockholm. He has been a visiting staff member at the IBM Thomas J. Watson Research Center and a consultant to the IBM Cambridge Scientific Center and is coauthor of several textbooks on probability and statistics. Professor Grenander is a member of the Royal Swedish Academy of Science, a Fellow of the Institute of Mathematical Statistics, and a member of the International Statistical Institute.

Ulrich Herzog

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Dr. Herzog was a member of the teleprocessing system optimization group at the Thomas J. Watson Research Center, being mainly concerned with problems of traffic flow in complex data networks. He had been on leave from the Institute for Switching Techniques and Data Processing at the University of Stuttgart, West Germany, since March 1973. Dr. Herzog received all his degrees in electrical engineering. From 1964 to 1970 he held at various times positions as research associate, assistant professor and chief engineer at the above mentioned institute. From 1970 to 1973 he headed the informatic research group, "stochastic service and transportation processes in computers and computer networks." He has also been Privatdozent at the University of Stuttgart since 1973. Dr. Herzog is a member of VDE (Society for Electrical Engineers in Germany) and NTG (Telecommunications Society).

Hisashi Kobayashi

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Dr. Kobayashi is manager of a system measurement and modeling group at the Thomas J. Watson Research Center. He joined the Research Division of IBM in 1967 and became involved in seismic signal processing, data communication theory, digital magnetic recording theory, and image data compaction. Beginning in 1971 he has been concerned with the development of general theory and methodologies for computer system performance evaluation. From 1963 to 1965 he worked at the Toshiba Electric Company, Tokyo, where he was engaged in the research and development of advanced radar systems. From 1969 to 1970 he was a Visiting Assistant Professor at the Department of System Science, University of California at Los Angeles, where he taught courses in probability and statistics, information theory, and signal detection theory. He holds B.S. and M.S. degrees in electrical engineering, obtained in 1961 and 1963, respectively, from the University of Tokyo and M.A. and Ph.D. degrees in electrical engineering, both received in 1967 from Princeton University. He is a member of Eta Kappa Nu, the Institute of Electrical and Electronics Engineers, the Association for Computing Machinery, the Institute of Electronics and Communication Engineers of Japan, and the Information Processing Society of Japan. He was awarded the RCA David Sarnoff Scholarship in 1960 and the Orson Desaix Munn Fellowship in 1965.

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Dr. Reiser joined IBM in 1968 at the Zurich Research Laboratory where he did work on semiconductor device modeling. He is currently at the Thomas J. Watson Research Center, where he is working on analytical and empirical models for system performance evaluation. His education includes an M.S. and a Ph.D. in electrical engineering, which he received from the Swiss Federal Institute of Technology (ETH), Zurich, in 1967 and 1971, respectively. Dr. Reiser is a member of the Association for Computing Machinery.

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Mr. Sampson is currently studying for a Ph.D. in mathematical statistics at the University of Michigan. He received his B.S. and M.S. degrees in the Division of Applied Mathematics at Brown University, Providence, Rhode Island, where he collaborated in the work with Professors Freiberger and Grenander which appears in this issue.

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Martin Schatzoff

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Dr. Schatzoff manages an operations research group at the Cambridge Scientific Center which is developing methodology for measuring, modeling, and improving operating system performance. He joined IBM in 1955 in the Endicott, N. Y. Product Development Laboratory as a statistical consultant (until 1957) and later (1959 to 1960) became manager of reliability analysis and prediction. He worked in General Products Division Headquarters in Harrison, N.Y., on the development of statistical models for product forecasting (1961 to 1962) and did research in interactive statistical computing at the Cambridge Scientific Center from 1964 to 1967. Dr. Schatzoff was a visiting associate professor of Statistics at Yale University from 1967 to 1968. He received a B.A. in economics from Brooklyn College in 1950, an M.B.A. in statistics from New York University in 1952, and an M.A. (1961) and a Ph.D (1964) in statistics from Harvard University. He is a member of the American Statistical Association and the Institute for Mathematical Statistics and has been elected a fellow of the American Statistical Association.

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Mr. Woo is a member of the teleprocessing system optimization group of the Computer Science Department at the Thomas J. Watson Research Center. His current interests involve the optimization of large computer networks and the analysis of queuing systems. He joined the Research Division in 1971. Prior to that, he worked at the IBM New York Scientific Center on mechanical and structural engineering problems. He received a B.S. degree in 1939 from the Chiao-Tung University in China and an M.S. degree in 1951 in mechanical engineering from the Virginia Polytechnic Institute. In 1970 he received the Levy award from the Benjamin Franklin Institute of Philadelphia for his contribution to the *Journal of the Franklin Instutute.*

Roger C. Wood

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Professor Wood is Chairman of the Department of Electrical Engineering and Computer Science at the Santa Barbara campus. His research interests are the educational use of computers and the analysis of computer system architecture. In 1954 he joined Ryan Aeronautical Company, working primarily on the analog simulation of stability and control systems. In 1959 he joined the System Development Corporation. In 1964 he became a member of the staff of the Department of Engineering at UCLA and in 1965 joined the faculty at UCSB. Professor Wood received the B.S. degree in engineering in 1954 and the M.S. degree in mathematics in 1956 from the University of Minnesota. He received the Ph.D. degree in engineering from the University of California, Los Angeles, in 1966. During his tenure at Ryan Aeronautical, Professor Wood coauthored a textbook on analog computation. He is a member of the Institute of Electrical and Electronics Engineers, the Association for Computing Machinery, the Computers in Education Division (COED) of the American Society for Engineering Education, the Operations Research Society of America, Sigma Xi, Tau Beta Pi, and Eta Kappa Nu.