Princeton University

Honors Faculty Members
Receiving Emeritus Status

June 2008

The biographical sketches were written by
colleagues in the departments of those honored.

Contents

Hisashi Kobayashi

Hisashi Kobayashi was born in Tokyo, Japan, on June 13, 1938. He studied at the University of Tokyo and received his B.S.E. and M.S.E. degrees in electrical engineering in 1961 and 1963, respectively. He was a recipient of the David Sarnoff RCA Scholarship in 1960, the first year that it was offered in Japanese universities, and the Sugiyama Scholarship in 1958–61. His master's thesis, "Ambiguity Characteristic of a Coded Pulse Radar," was supervised by the late Professors Yasuo Taki and Hiroshi Miyakawa. From 1963 to 1965 he worked for Toshiba Electric Company, where he was engaged in research and development of an over horizon radar. Encouraged by his brother Shoshichi, he soon decided to come to the United States for doctoral study. He matriculated at Princeton University in 1965 as the recipient of the Orson Desaix Munn Fellowship and received his Ph.D. degree two years later in August 1967. His thesis, "Representation of Complex-Valued Vector Processes and Their Applications to Estimation and Detection," was supervised by Professor John Thomas.

In September 1967 he joined the IBM T. J. Watson Research Center as a research staff member of the Applied Research Department, and worked on the LASA (large aperture seismic array) Project, data transmission theory, high-density digital magnetic recording theory, and image compression algorithms.

In 1971 he was appointed manager of the Systems Measurement and Modeling group, newly created in the Computer Science Department at the IBM Research Center. In 1974 he was promoted to senior manager of Systems Analysis and Algorithms and directed five groups: computer performance modeling, teleprocessing and communication networks, satellite communications, computer network measurement and control, and storage management and analysis.

During the 1970s, Hisashi's own research focus shifted to queueing theory and its applications to computer systems performance evaluation. His work on diffusion approximation to queueing networks was published in the April and July 1974 issues of the *Journal of ACM.* In 1978, he published a graduate textbook, *Modeling and Analysis: an Introduction to Systems Performance Evaluation Methodology,* and in 1979 he became the founding editor-in-chief of an the international journal *Performance Evaluation.*

In 1981, he was appointed department manager of IBM's newly created VLSI Design Department, which consolidated all the VLSI design methodology and microprocessor chip design efforts at IBM Research. One year later, he was appointed founding director of IBM Japan Science Institute, later named the IBM Tokyo Research Laboratory. He directed a number of research projects in computer science/ engineering and manufacturing technologies: knowledge base systems, medical information system, natural language processing, Kanji-input system, Japanese speech recognition, handwritten character recognition, image and graphics processing, communication networks, software engineering, VLSI design, parallel processing architecture, advanced workstation, and robotic systems. The number of staff grew to more than 200 during his four-year appointment.

During Hisashi's 19-year association with IBM, he utilized the Research Division's sabbatical leave program to maintain close ties with a number of universities, and he served as a visiting faculty member at the University of California–Los Angeles, the University of Hawaii, Stanford University, the Technische Hochschule Darmstadt in the Federal Republic of Germany (where he served as a recipient of the Senior U.S. Scientist Award from the Alexander von Humboldt Foundation), and at the Université Libre de Bruxelles in Belgium.

In 1986 he joined the faculty of Princeton University as dean of the School of Engineering and Applied Science and was named the Sherman Fairchild University Professor of Electrical Engineering and Computer Science. He arrived during a period of rapid expansion

at the school in terms of the kinds and amount of sponsored research undertaken within the various disciplines and, in fact, of the disciplines themselves, and in terms of the new linkage between the school and other disciplines within the University. He played a key role in establishing several interdisciplinary and/or inter-institutional centers and programs in such areas as material science, opto-electronics, earthquake engineering, surface engineered materials, discrete mathematics for computer science, and plasma etching. During the five years (1986–1991) of his tenure as dean, the number of permanent faculty members in the school grew by almost 30 percent (from 83 to 107), and the undergraduate female enrollment increased from 20 percent to 25 percent. The total sponsored research grew by as much as 60 percent, and corporate gifts increased by 150 percent. After completing his term as dean, he accepted the NEC C&C Visiting Professorship at the Research Center for Advanced Science and Technology, the University of Tokyo (1991–92). He returned to Princeton in 1992 to assume a full-time research and teaching position in the Department of Electrical Engineering.

Hisashi is in the process of writing several textbooks based on his Princeton lecture notes. *Modeling and Analysis: Foundations for System Performance Evaluation,* coauthored by Brian Mark of George Mason University, recently was published by Prentice Hall. Currently, he is working on *Probability, Random Processes, and Statistical Analysis,* to be published by Cambridge University Press in 2009.

He is a co-recipient of the 2005 Eduard Rhein Technology Award of Germany for his 1969 invention of a high-density digital recording scheme, now widely known as PRML (partial response coding, maximum likelihood decoding). He is an IEEE Fellow (1977), IEEE Life Fellow (2003), and IEICE Fellow of Japan (2004). He received the Humboldt Prize of West Germany (1979) and IFIP's Silver Core (1980). Hisashi was elected to the Engineering Academy of Japan in 1992.

Hisashi has served on advisory boards of many organizations, including SRI International; NASA; Institute of System Science and Kent Ridge Digital Laboratory of Singapore; Advance System Institute of British Columbia; Advanced Institute of Science and Technology of Ministry of Economy, Trade, and Industry of Japan; and the Executive Committee of the 21st Century Center of Excellence Program, Ministry of Culture and Education of Japan.

Most recently, Hisashi was appointed to the Board of Directors of the Friends of Todai (University of Tokyo) Foundation, Inc. USA, and as an adviser to the National Institute of Information and Communications Technology, Japan, for their project on the next-generation Internet.