FOREWORD

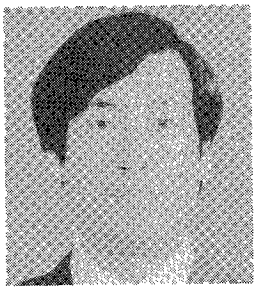
Special Section on Spread Spectrum Techniques and Applications

R. Kohno

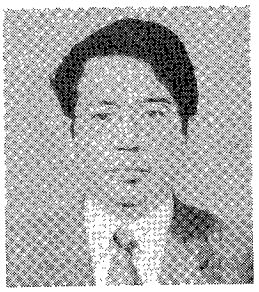
K. Tsubouchi

P. Jung

M. Sengoku



T. Ikegami

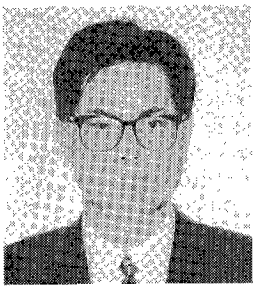


H. Tachika

Y. Furuya

Y. Tozawa

T. Hasegawa



S. Sasaki

H. Habuchi

Spread spectrum techniques become a key technology for a wide variety of appllications in communications, ranging and so on. In particular, code division multiple access (CDMA) based on a spread spectrum technique is one of the most attractive techniques for future public land mobile telecommunication systems, i.e. FPLMTS or IMT2000. Therefore, there have been held many international conferences on mobile communications and information theory which involve a lot of papers regarding CDMA and other topics on spread spectrum. In this year, IEEE International Symposium on Spread Spectrum Techniques and Applications, i.e. ISSSTA'96, which was held in Mainz, Germany during Sept. 22-25, 1996 in cooperation with IEICE, must be only one international conference specified on spread spectrum techniques and applications.

This special section was planned to cover some of excellent papers which would be submitted to ISSSTA'96. It contains two invited papers, several papers and letters which were selected by a very strict review procedure. The first invited paper was written in order to introduce the pros and cons of CDMA as a multiple access scheme theoretically. The second one was written to overview Japanese activities for standardization of FLPMTS. The selected papers cover a wide range of topics on spread spectrum techniques and appllications.

The guest editors would like to express their sincere appreciation to the authors and the reviewers, because this special section was published under a tight time schedule in order to involve timely subjects. The guest editors also would like to thank Prof. P. W. Baier and Dr. P. Jung who kindly helped us as the Chairman and the Secretary of ISSSTA'96 Technical Program Committee. The cooperation of the Editorial Board of IEICE Transactions and the publication staff are greatly appreciated.

Ryuji Kohno, Guest Editor-in-Chief

Ryuji Kohno (*Member*) was born in Kyoto, Japan. He received the B.E. and M.E. degrees in computer engineering from Yokohama National University in 1979 and 1981, respectively, and the Ph.D. degree in electrical engineering from the University of Tokyo in 1984. He joined in the Department of Electrical Engineering, Toyo University in 1984 and became an Associate Professor in 1986. Since 1988 he has been an Associate Professor in the Division of Electrical and Computer Engineering, Yokohama National University. During 1984-1985, he was a Visiting Scientist in the Department of Electrical Engineering, the University of Toronto. At the present, he is the Chairman of the Society of Spread-Spectrum Technology of the IEICE (Institute of Electronics, Information, Communications Engineers), a director of IEICE Tokyo Section, an editor of both IEEE Transactions on Communications and that on Information Theory, and an editor of the IEICE Transactions on Fundamentals (English Volume). He was the Chairman of the Technical Program Committee of 1992 IEEE International Symposium on Spread-Spectrum Techniques and Applications (ISSSTA'92), and has been chairing and organizing several international conferences and workshops. His current research interests lie in the areas of adaptive signal processing, coding theory, spread spectrum system, and their applications to various kinds of practical communication and ranging systems. He is a member of IEEE, EURASIP, IEEJ, IPSJ and SITA. He wrote technical books entitled "Spread Spectrum Techniques and Applications," "Digital Signal Processing," "Data Communication Systems" and is currently writing the book entitled "Advanced Spread Spectrum Techniques and Application."

Kazuo Tsubouchi (*Member*) was born in Kyoto, Japan on February 6, 1947. He received the B.S., M.S., and Ph.D degrees in electronics engineering from Nagoya University in 1969, 1971, and 1974, respectively. Since 1974, he has been with the Research Institute of Electrical Communication, Tohoku University, Sendai, Japan, where he is currently a Professor on the Acoustoelectronic Integration Division. He spent 1982 at Purdue University as a Visiting Associate Professor. His current interests are in SS/CDMA wireless communication system, GHz-range RF IC, GHz-range SAW devices, low-power Si ULSI, and Si microfabrication technology. Dr. Tsubouchi received the Hattori-Hoko Award in 1983 and the Ichimura Award in 1994, and the Telecommunication Advancement Foundation Award in 1996. He is a member of the Institute of Electrical and Electronics Engineers (IEEE), the Institute of Electrical Engineers of Japan, the Physical Society of Japan, and the Japan Society of Applied Physics.

Peter Jung (*Member*) was born on March 15, 1964, in Kaiserslautern, Germany. From 1983 until 1990, he studied physics and electrical engineering at the University of Kaiserslautern, Germany. He received the M.Sc. (Dipl. -Phys.) degree in physics in 1990 and the Ph.D. (Dr. -Ing.) degree in electrical engineering in 1993, both from the University of Kaiserslautern. In 1996, he received the Dr.Sc. (Dr. -Ing. habil.) degree from the Department of Electrical Engineering, University of Kaiserslautern, and became private educator (Privatdozent). He gives lectures on radio and mobile communications and advises the practical courses on RF communications. From May 1990 until September 1992, he was with the Microelectronics Centre of the University of Kaiserslautern (ZMK), where he was engaged in the design and implementation of Viterbi equalizers for mobile radio applications. Since October 1992, he has been vice director of the Research Group for RF Communications at the University of Kaiserslautern. His research interests are in coding, modulation, signal processing, multiple access techniques and protocols for mobile communications. Dr. Jung has published over twenty papers in archival journals and contributed some forty manuscripts to various conferences and symposia. He has served on the committees of various conferences such as the IEEE Vehicular Technology Conference 1995, the IEEE Vehicular Technology Conference 1997 and the IEEE Fifth International Symposium on Spread Spectrum Techniques & Applications (ISSSTA) 1998. He is the Secretary of the Technical Program Committee of the IEEE ISSSTA '96 to be held in Mainz, September 22-25, 1996. Since 1991, Dr. Jung has been engaged in the pan-European Cooperation in the Field of Scientific and Technical Research (COST) Action 231. He participates in the AC090 FRAMES (Future Radio Wideband Multiple Access Systems) project within the EU programme ACTS (Advanced Communications Technologies and Services) as technical manager of the project team at the University of Kaiserslautern. Dr. Jung is a member of IEEE, VDE and AES. Since July 1996, he has been secretary of the IEEE Communications Society Chapter Germany.

Masakazu Sengoku (*Member*) was born in Nagano prefecture, Japan, on October 18, 1944. He received the B.E. degree in electrical engineering from Niigata University, Niigata Japan, in 1967, and the M. E. and Dr. Eng. degrees in electronic engineering from Hokkaido University in 1969 and 1972, respectively. In 1972, he joined the staff at the Department of Electronic Engineering, Hokkaido University as a Research Associate. In 1978, he was an Associate Professor at the Department Information Engineering, Niigata University, where he is presently a Professor. His research interests include network theory, graph theory, transmission of information and mobile communications. He received the 1992 and 1996 Best Paper Awards from IEICE. He was the chairperson of the IEICE Technical Group on Circuits and Systems in 1995. Dr. Sengoku is a member of IEEE and the Information Processing Society of Japan.

Tetsushi Ikegami (*Member*) was born in Tokyo, Japan, in 1957. He received the B.E., M.E. and Dr. E. degrees all in electrical engineering from Meiji University, Kawasaki, Japan in 1980, 1982, 1995 respectively. In 1985 he joined the Communications Research Laboratory, Ministry of Posts and Telecommunications, and has been engaged in the development of mobile, fixed and inter satellite communication systems. From 1991 to 1992 he was a visiting scholar at the University of Illinois at Urbana-Champaign. Currently, he is a chief of Satellite Communications Section of the Kashima Space Research Center of CRL. His research interests are in the areas of satellite and fading channels, modulation, coding and spread spectrum systems. Dr. Ikegami is a member of SITA and IEEE.

Hisao Tachika (*Member*) was born in Osaka, Japan, on July 24, 1947. He received the B.S. and M.S. degrees in electrical engineering from Osaka City University, Osaka, Japan, in 1970 and 1973, respectively. Since 1973, he has been with Mitsubishi Electric Corporation, Japan, where he has been engaged in research and development of analog/digital mobile radio communication systems and spread spectrum communication systems. He is now a Manager of Mobile Communication Team in the Radio Communications Department of Information Technology R&C Center.

Yukitsuna Furuya (*Member*) graduated from Kyoto University, Kyoto, Japan in 1974. Right after that, he joined NEC corporation and engaged in research of satellite and mobile communications. During August 1982-August 1983, he stayed at Columbia University, New York as a visiting researcher. He is currently a senior manager of Personal C&C Development Laboratory, NEC Corporation. Mr. Furuya is a member of IEEE.

Yoshiharu Tozawa (*Member*) was born in Nagoya, Japan, in February 1957. He received the B.E. degree in electronic engineering from Nagoya Institute of Technology, Nagoya, Japan in 1979 and the M.E. degree in electronic engineering from Nagoya University, Nagoya, Japan in 1981, respectively. He joined Fujitsu Laboratories Ltd., Kawasaki, Japan in 1981. From 1982 to 1989, he was engaged in research of the frequency converter and the digital signal processing modem for satellite communications systems. He has been engaged in research of the frequency hopping modem for wireless LAN. He is now involved in multimedia mobile communications.

Takaaki Hasegawa (*Member*) received his B.E. and M.E. and Ph.D. degrees in Electrical Engineering from Keio University in 1981, 1983, and 1986, respectively. He joined the Faculty of Engineering at Saitama University in 1986. He has been an Associate Professor since 1991. His research interests include human communications, human machine interfaces and spread spectrum communications. From 1995 to 1996, he was a visiting scholar at the University of Victoria. He is the author of the book Primary C Language Note (Japanese, HBJ, 1989), a co-author of the books: Fundamentals and Applications of Spread Spectrum Communication Technologies (Japanese, Triceps, 1987), Application Technologies of Spread Spectrum Communications (Japanese, Triceps, 1992), and Personal Communications and Consumer Communications (Japanese, Baifukan, 1994). He is a member of IEEE, and SITA (The Society of Information Theory and its Applications, Japan).

Shigenobu Sasaki (*Member*) was born in Nara, Japan on April 18, 1964. He received B.E., M.E. and Dr. Eng. degrees from Nagaoka University of Technology, Nagaoka, Japan, in 1987, 1989 and 1993, respectively. Since 1992, he has been with the Department of Electrical and Electronics Engineering, Faculty of Engineering, Niigata University, Niigata, Japan, where he is now Assistant Professor. His research interests are in communication systems and signal processing, especially spread spectrum communication systems and mobile communications. Dr. Sasaki is a member of IEEE and SITA, Japan.

Hiromasa Habuchi (*Member*) was born in Hyogo, Japan, on July 4 1963. He received the B.E., M.E. and Ph.D degrees in Electorical Engineering from Saitama University, in 1987, 1989 and 1992, respectively. He joined in Faculty of Engineering, Ibaraki University in 1992. Since 1992 he has been a research associate at Ibaraki University. His research interests are in Spread-Spectrum Communications, Synchronization Systems and Optical Communications.