



THE CHINESE UNIVERSITY OF HONG KONG
Department of Information Engineering

Seminar

Optical Coding Theory

by

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The Chinese University of Hong Kong

Abstract

With the advancement of technology, recent progress in optical code division multiple access (O-CDMA) is tremendous and O-CDMA systems are closer to deployment than ever before. Similar to its wireless counterpart, O-CDMA is found to have advantages over other optical multiple-access technologies and may become one of the chosen technologies in future optical networks and systems. Since 1980's, optical codes have been designed, leading to the birth of Optical Coding Theory. This new field includes constructions of optical codes for various O-CDMA applications, improvement in analytical techniques on code performance, and development and demonstration of novel coding techniques supported by latest hardware technologies. In this talk, we first discuss the development and some results of Optical Coding Theory. We then study how optical codes can be used to improve transmission rate and to provide QoS control and service prioritization in multirate, multimedia O-CDMA systems. Finally, we will investigate how the theory can be applied to other disciplines, such as preventing four-wave-mixing in WDM systems.

Biography

Wing C. Kwong received the Ph.D. degree in electrical engineering from Princeton University, Princeton, New Jersey, in 1992. After graduation, he joined the faculty of Hofstra University, Hempstead, New York, where he is presently a professor in the Department of Engineering. His research interests are centered on optical communication systems, optical multiple-access networks, and ultrafast all-optical signal processing techniques. He co-authored the first-of-its-kind technical book on optical CDMA, Prime codes with applications to CDMA optical and wireless networks (Artech House, 2002) and contributed one chapter on Optical Coding Theory to another optical CDMA book, Optical Code Division Multiple Access: Fundamentals and Applications (Taylor & Francis, 2006). He has published over 120 professional articles, and chaired technical sessions and served technical program committees in international conferences. He has given invited seminars in various countries and tutorials on optical CDMA.

Dr. Kwong is a senior member of the IEEE and an Associate Editor of the IEEE Transactions on Communications. He was the recipient of the NEC Graduate Fellowship awarded by the NEC Research Institute, USA, in 1991. He received the Young Engineer Award from the IEEE (Long Island Chapter) in 1998.

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