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THE CHINESE UNIVERSITY OF HONG KONG

Department of Information Engineering

Seminar

Algebraic Codes for Optical CDMA and Their Applications

by

Professor Wing C. Kwong

Department of Engineering

Hofstra University

U.S.A.

Date : 25 Nov., 2013 (Mon.)

Time : 11:00am-11:40am

Venue : Room 833 Ho Sin Hang Engineering Building
The Chinese University of Hong Kong

Abstract

With the advancement of technology, optical code-division multiple access (O-CDMA) has recently been attracting attention due to its various advantages over other optical multiple-access schemes. In parallel to its wireless counterpart, O-CDMA, which also requires the support of suitable codes, may become the preferred technology in future optical networks and systems. In this seminar, O-CDMA is first compared with other optical multiple-access schemes along with its unique characteristics and advantages. A brief overview of optical coding theory is then given. We will also discuss how quality-of-services and service prioritization can be supported in multirate, multimedia O-CDMA systems by means of specially designed optical codes. Afterward, a class of algebraic optical codes---multilevel prime codes (MPCs)---will be studied. Besides having large code cardinality for accommodating many subscribers, the MPCs possess a unique tree structure of multiple levels of subsets of codewords for adjustable code performance and cardinality. Being investigated in the final part of the seminar, these characteristics open up contemporary applications in the areas of code switching and secure/obscure communications in scalable O-CDMA systems and networks.

Biography

Wing C. Kwong received the Ph.D. degree in electrical engineering from Princeton University, Princeton, New Jersey, U.S.A., 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 and the newly established School of Engineering and Applied Science.

Dr. Kwong co-authored the first-of-its-kind technical book on optical code-division multiple access (CDMA), Prime Codes with Applications to CDMA Optical and Wireless Networks (Norwood, MA: Artech House, 2002), and contributed one chapter to another optical CDMA book, Optical Code Division Multiple Access: Fundamentals and Applications (Boca Raton, FL: Taylor & Francis, 2006). He recently co-authored the first monograph on optical coding theory, Optical Coding Theory with Prime (NY: CRC Press, 2013). He has also published numerous professional articles, and chaired technical sessions and served on technical program committees at international conferences. He has given seminars and tutorials in optical CDMA and optical coding theory worldwide.

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.

**** ALL ARE WELCOME ****

Host: Professor Wing-Shing Wong (Tel: 3943-8378, Email: wswong@ie.cuhk.edu.hk)
Enquiries: Information Engineering Dept., CUHK (Tel.: 3943-8385)