

Signal Processing & Communications Seminar

Title: Semantic Coding

Speaker: Dr. Ton Kalker
HP Labs
Palo Alto, CA

Date: Thursday, November 20, 2008

Time: 4:00 - 5:00 pm

Where: B02 CSL

Abstract: Shannon wrote in 1948: "The semantic aspects of communication are irrelevant to the engineering problem". He demonstrated indeed that the information generated by a source depends only on its statistics and not on the meaning of the source output. In this talk we consider the systems where codewords do have meaning, i.e. where codewords are semantic and close to the original source sequences. In this talk we define the notions of semantic compaction, transmission and compression. We state some fundamental limits, and sketch proof strategies. As a corollary, we state a fundamental limit on correlated watermarking.

*** This is joint work with Frans Willems ***

BIO: Ton Kalker received his Ph.D. degree in mathematics from the Rijksuniversiteit Leiden, The Netherlands, in 1986.

From 1986 to 2004 he was with Philips Research, Eindhoven, The Netherlands, working on formal verification of VLSI design (1986 - 1991), video and image coding (1992 - 1995), watermarking (1996 -2000) and robust hashing (2001 - 2004). In 1994 he was a visitor scholar at the University of California Berkeley. From 1999 to 2005 he was part-time faculty at the University of Eindhoven, teaching 'signal processing for data protection'. He was elected Fellow of IEEE in 2001 for his contributions to practical applications of watermarking. In 2004 he joined Hewlett-Packard Laboratories as a Distinguished Technologist, focusing on media security, interoperability of DRM system in particular. His interests include signal and image processing, biometrics, watermarking, robust hashing, cryptography, fingerprinting and tracing, processing in encrypted domains, and Digital Rights Management.

He was instrumental in the creation of the Content Identification business unit of Philips Electronics, successful in commercializing watermarking and other identification technologies. He is currently one of the lead architects of the Coral consortium on DRM interoperability.

Ton Kalker is an active member of academic community, in particular IEEE Signal Processing, IEEE Information Theory, SPIE Electronic Imaging and AES. He has served on multiple Ph.D. thesis committees, and he is a frequently invited speaker at conferences and panels on issues of multimedia security. He serves on multiple conference program committees, and has been co-chair of the International Workshop on Digital Watermarking (IWDW). He has been associate editor of IEEE T-MM, and is reviewer for T-SP, T-IP, T-MM and T-IT. He has been a member of the IMDSP TC and chair of the IFS TC. He has(co-)authored more than 180 journal and conference submissions, as well as 30 patents and 39 patent applications.

Ton Kalker is one of the co-founders of the IEEE Transactions on Information Forensics, for which he currently serves as an associate editor. He served as the first Chair of the IEEE Technical Committee of Information Forensics and Security. He is on the scientific advisory board of the European projects ECRYPT and SPEED.