THE CHINESE UNIVERSITY OF HONG KONG
Institute of Network Coding
and
Department of Information Engineering
Seminar

Coding for the Correction of Synchronization Errors
by
Prof. Albert Helberg
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South Africa

Date : **27 October, 2010 (Wednesday)**
Time : **2:30 – 3:30 pm**
Venue : **Room 833, Ho Sin Hang Engineering Building**
The Chinese University of Hong Kong

Abstract

Synchronisation is often assumed by the information engineer when working with data. However, diverse systems such as magnetic and optic storage systems, semiconductor devices as well as communication networks are affected by uncertainties in timing. This timing noise introduces or removes spurious symbols in the symbol stream, known as insertion or deletion errors. These errors differ from additive errors and erasure errors in that both the position and value of the error must be determined before correction can take place.

In this seminar a brief survey of previous work in synchronization error correction coding is given. We start by introducing definitions for different synchronization errors, followed by definitions for synchronization error correction. The foundation for correcting synchronization errors provided by VI Levenshtein is then discussed. We finally present a general construction of binary algebraic block codes for the correction of multiple random insertion/deletion errors. The talk is concluded with some open problems and possible novel applications of synchronization error correction adjacent to the field of Network Coding.

Synchronization error correcting coding is seldom mentioned in literature, due to the lack of understanding of the theory of synchronization channels as well as a lack of adequate mathematical models for this class of errors. This seminar should be of interest to anyone that haven't come across these codes before and aims to stimulate interest in this research field.

Biography

Albert Helberg obtained the B.Eng (Cum Laude 1989), M.Eng (Cum Laude - 1991) and D.Eng (1993) degrees in electronic engineering from the Rand Afrikaans University, South Africa. After spending time in industry, Albert was appointed at the North-West University in 2001 as professor. Prof. Albert Helberg is currently the research team leader in the TeleNet research group of the Telkom CoE at the North-West University and has filled several management positions in the Faculty, including Director of the School of Electrical, Electronic and Computer Engineering (2002-2006), Director Quality and Teaching (2007-2008) as well as Acting Dean of the Faculty of Engineering (2009). His personal research interests include digital coding techniques for error correction.

** ALL ARE WELCOME **

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