



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



## Should Coded Modulation Be Based on Orthogonal Pulses?

by  
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**Time : 11:00 am – 12:00 pm**  
**Venue : Room 833, Ho Sin Hang Engineering Building**  
**The Chinese University of Hong Kong**

### Abstract

Most modulations, whether coded or not, are based on linear modulation with orthogonal (Nyquist) pulses. Is this a good idea? We summarize a number of recent advances that say it is not. Codes exist, based on simple *non-orthogonal* binary linear modulation, that have capacities higher than any orthogonal-pulse signaling scheme, no matter what its symbol alphabet. The major reason these can exist is the behavior of capacity when the bits carried per Hz-s is high. A practical kind of non-orthogonal signaling is the so-called faster than Nyquist method, first proposed by Mazo in 1975.

### Biography

John B Anderson is Ericsson Professor in Digital Communication in the Department of Electrical and Information Technology Department, Lund University, Sweden. He is also Director there of the Swedish Strategic Center for High Speed Wireless Communication. He has written 6 books in the fields of coding and communication engineering. His works include the first books and papers to appear in coded modulation as well as many basic papers on the complexity of decoding algorithms. He has served as President of the IEEE Information Theory Society and as general chair of several of its international symposia.

**\* ALL ARE WELCOME \*\***