SHANNONIAN LESSONS FOR WIRELESS MULTIMEDIA COMMUNICATIONS, THE 'WORLD-WIDE WAIT' AND 'GREEN' RADIOS...

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Abstract

Since Marconi demonstrated the feasibility of radio transmissions, researchers have endeavoured to fulfill the dream of flawless wireless multimedia telecommunications, creating the impression of tele-presence - at the touch of a dialling key and with the aid of the future wireless solutions to be discussed in the lecture.

Commencing with a light-hearted historical perspective on the generations of wireless systems, Shannon's lessons are contrasted with the practical constraints imposed on state-of-the-art multimedia communicators. In the face of adverse wireless channel conditions it is unrealistic to expect that any fixed-mode wireless system remains capable of maintaining a constant quality-of-service. This motivates the design of cutting-edge near-instantaneously adaptive modulation and coding aided multi-media transceivers, which offer capabilities beyond those of conventional systems. Indeed, they facilitated in excess of a 1000-fold bit-rate increase since the conception of GSM...

However, at what price? Furthermore, is this 1000-fold bit-rate increase sufficient anyway to support the impression of flawless tele-presence with its sense of joy, wonder and ambiance? Or are we about to be further frustrated by the 'World-Wide Wait' (WWW) experienced at places of high tele-traffic density?

A glimpse of the recent advances in Multiple-Input Multiple-Output (MIMO) techniques employing adaptive antenna arrays reveals that they are capable of circumventing the 'world wide wait' in the emerging wireless Internet, while facilitating sustainable, 'green' communications...
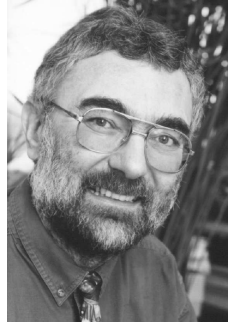
Lajos Hanzo received his degree in electronics from the Technical University of Budapest in 1976, his doctorate in 1983, defended his DSC Candidate thesis in 1992 and his Doctor of Sciences (DSc) degree in 2004. He is a Fellow of the Royal Academy of Engineering (FREng). During his career in telecommunications he has held various research and academic posts in Hungary, Germany and the UK. Since 1986 he has been with the School of ECS, University of Southampton, UK, where holds the Chair in Telecommunications.

He co-authored 18 Wiley - IEEE Press books [1]-[18] totalling in excess of 10 000 pages on mobile radio communications, published in excess of 900 research papers and acted as General Chair/TPC Chair and keynote speaker of major IEEE Conferences, such as WCNC'2009, WCNC'2006, Mobimedia'2008, Mobimedia'2009, CNSR'2009, etc. He has also been awarded a number of distinctions, such as the IEEE Wireless Technical Committee Achievement Award and the IET's Sir Monti Finniston Award across all disciplines. He received Best Paper Awards for example at WCNC'2007 and ICC'2009. He heads an academic research team, working on a range of research projects in the field of wireless multimedia communications sponsored by industry, the Engineering and Physical Sciences Research Council (EPSRC) UK, the European Commission and the Mobile Virtual Centre of Excellence (VCE), UK. He is an enthusiastic supporter of industrial and academic liaison and he offers a range of industrial courses. Lajos is an IEEE Distinguished Lecturer as well as Governor of both the IEEE Communications as well as of the Vehicular Technology Society and a Fellow of both the IET and the IEEE. He is the Editor-in-Chief of the IEEE Press. For further information on research in progress and associated publications please refer to http://www-mobile.ecs.soton.ac.uk;

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[1] For detailed contents please refer to http://www-mobile.ecs.soton.ac.uk

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