Third-Generation Wireless Standards, Algorithms and Future Solutions:
Burst-by-burst Adaptive Multimedia Transceivers

Prepared and presented by
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Course Lecturer

Lajos Hanzo graduated in Electronics in 1976 and in 1983 he was conferred a doctorate in the field of Telecommunications. During his 24-year career in communications he has held various research and academic posts in Hungary, Germany and the UK. Since 1986 he has been with the Department of Electronics and Computer Science, University of Southampton, UK and has been a consultant to Multiple Access Communications Ltd., UK. Currently he holds a Chair in Telecommunications. He co-authored five books on mobile radio communications, published about 300 research papers and was awarded a number of distinctions. His current teaching and research interests cover the range of **Mobile Multimedia Communications**, including voice, audio, video and graphical source compression, channel coding, modulation, networking as well as the joint optimisation of these system components. He is managing research in the field of wireless multimedia communications funded by the Engineering and Physical Sciences Reseach Council (EPSRC) and in the area of Software Defined Radio (SDR) systems under the auspices of the Pan-European IST programme funded by the Comission of European Communities (CEC). He also conducts research for the Mobile Virtual Centre of Excellence (VCE) in the UK. He is a member of the IEE and senior member of the IEEE.

Abstract

The third-generation (3G) wireless standards are reaching a state of maturity and chip- as well as equipment developments are well under way right across the globe, in order to be able to roll out services during the first half of the new millenium. The efforts of the research community were targeted at defining a single global standard for the sake of supporting global roaming. Although both the Japanese and the European proposals are based on Wideband Code Division Multiple Access (W-CDMA) and hence they exhibit striking similarities, a range of differences can be found in the standards. The Pan-American 3G system proposal known as cdma2000 is based on multi-carrier CDMA. Since no global standard agreement has been reached, the ratified 3G standard framework is actually based on an amalgam of six various individual standards.

This overview highlights the main features of the most dominant standard components. A range of multimedia services that can be supported by the 3G standards are highlighted and the associated speech as well as video performaces are characterised. The overview is concluded with an outlook to a range of powerful potential future wireless system concepts that allow us to accommodate time-variant service requirements, while exploiting the time-variant nature of wireless channels using the principles of near-instantaneously adaptive transceivers.

Intended Audience

This research overview endeavours to assist a wide range of audience by assuming a modest background knowledge in the field of signal processing and communications, while stimulating an informal and interactive atmosphere. Postgraduate researchers, system engineers, industrialists, managers and visual communications practitioners may find the coverage of the tutorial attractive.

[1] For further information please refer to this WWW address