Software Radio

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Software Radio

Technologies and Services

With 209 Figures

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Preface

Mobile communications technologies and services are world wide considered one of the key factors for the economic development of industrialised as well as less-developed countries in the near and mid-term future.

Next generation mobile communications presently are in the standardisation phase and will likely employ different techniques and standards. The implementation of as many as possible transceiver functionalities in software appears to be the most effective solution to cope with the multiplicity of communications alternatives. Software Radio technology will provide flexible mechanism for the configuration and management of mobile networks.

The concept of Software Radio, dating back to 1991, originally attracted commercial interest due to the possibility that transmission layer functions could be fully software-defined. During the years the concept and the technical interest extended to protocols of the higher layers too, thus conceiving a programmable hardware to implement the functionalities of several layers protocols by resident software or software downloaded from the network.

Software Radio is world-wide recognised as an approach that will be able to greatly improve technical and service performance of next generation mobile communications systems and we can expect that its introduction will deeply characterise and be the distinguishing feature of the mobile communications of the future.

This volume, containing the contributions presented at the 12th Tyrrhenian International Workshop on Digital Communications focused this year on *Software Radio Technologies and Services*, includes the updated state-of-the-art of the enabling technologies and the prospective services of software radio implementations for future mobile communications. The contributions come from leading experts and researchers in the field from Europe, Japan and USA.

Part 1 *Software Radio for Universal Wireless Internet Access* deals with wireless access scenario and the role of software radio is expanded beyond the air interface to enable new high-speed, packet-switched, IP-based wireless network.

Part 2 *Software Radio for Multimedia Communications* deals with Implementation stage of Software Radio for third generation mobile communication including capacity consideration and adaptive scheme selection for Software Radio multimedia communications and application to surveillance networks.

Part 3 *Software Radio Architecture* deals with the architecture evolution for military Software Radio and commercial development for future wireless systems.

Part 4 *Software Radio Technology towards Pervasive Appliance* deals with applications for mobile appliance, for Intelligent Transport Systems, for Air Traffic Control application and an overview of Software Radio technology in Japan.

Part 5 *Network Architecture, Protocols and Services* deals with new developments at the higher levels, protocol stacks and open platforms and service reconfigurability.

Part 6 *Enabling technologies* shows different front end architectures for cellular mobile systems, and future alternative for a CDMA satellite modem.

Finally I would like to express my sincere and grateful appreciation to the session organisers whose dedicated and enthusiastic effort has made the Workshop not only possible but more importantly of scientific value and to thank the authors for their updated contributions.

Enrico Del Re
September 2000

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