
Preface

The 18th Tyrrhenian Workshop on digital communications is devoted to wireless communications. In the last decade, wireless communications research boosted launching new standards and proposing new techniques for the access technology. We moved from the UTRA standard capable to transmit 0.5 bit/s/Hz to WLAN which is promising 2.7 bit/s/Hz. Now wireless communication systems are facing a flourishing of new proposal moving from multiple antennas at transmitter and receiver side (MIMO systems), to new powerful Forward Error Correction Codes, to adaptive radio resource management algorithms. The new challenge, however, is the move towards multimedia communications and IP technology. This move implies efforts in several new aspects. First of all an open network, as IP is, imposes the necessity of a secure network, to guarantee the privacy of the ongoing communications, avoid the use of the networks by unauthorized customers, avoid the misuses and the charge to third parties of the cost of the connection. Also, quality of service (QoS) of the communications is becoming a must in IP networks which are carrying services which need a guaranteed QoS as telephony, real time services, etc. To get this new target some form of access control to the network must be setup. Recently, new form of communication networks has appeared to collect data for several applications (sensor networks, ad hoc networks, etc.) and they need a connection with a backbone network which could be a wireless one with a larger range than the sensor or ad hoc networks. These new networks are helpful for monitoring applications, and for actuation of some measure to permit a regular use of the available resources. An example could be the use of a road lane in one or opposite direction in different hours of the day as traffic condition requires.

This workshop is trying to put together all these new aspects of wireless communication systems.

It is organized in five sessions entitled: “4G wireless systems”, “ad hoc and cellular networks”, “security and applications in wireless networks”, “QoS and efficiency in multimedia heterogeneous wireless networks”, and “wireless sensor networks”.

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The papers that will be presented represent an up-to-date critical analysis of the state of the art in each of the five areas and they will represent a reference for future development.

As final remarks, we express our gratitude to the session organizers, H. Ogawa, NiCT, Japan; M. Zorzi, University of Padova and CNIT, Italy; A. Prasad, DoCOMO Eurolabs, Germany; A. Jamalipur, University of Sydney, Australia; Shu Kato, NiCT, Japan, which have been in charge of selecting the papers for the workshops.

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