

JOURNAL OF TELECOMMUNICATIONS AND INFORMATION TECHNOLOGY

Preface

In the first year of the twenty first century, we are witnessing unprecedented growth in both quality and quantity of services offered by communication systems. While communications practitioners are endeavouring to translate existing recent advancements into product development, researchers continue scanning the horizon for new ideas and solutions in order to approach theoretical performance predictions. Most of those recent advancements in communication systems performance have been only possible because of signal processing applied in all areas of communication systems development and implementation. The special issue *Signal Processing for Communication Systems* consists of an invited paper and eight regular contributions.

In the invited paper *An introduction to envelope constrained filter design*, Cantoni, Vo, and Teo provide an overview of key ideas related to robust continuous time envelope constrained filter design. The paper is concerned with time domain synthesis of a filter whose response to a specified input signal stays within prescribed bounds and in addition has minimal noise enhancement. The specification of the output constraint envelope can arise either from standards set by certain regulatory bodies or practical design considerations.

The second paper *Source enhanced linear prediction of speech incorporating simultaneously masked spectral weighting* by Lukasiak and Burnett deals with a modification of the method to calculate linear predictor coefficients based on the simultaneous masking property of a human ear. It is shown that by applying the proposed modification an improvement in subjective quality can be achieved without an increase of transmission rate at the price of a modest increase in computational complexity.

The next four papers consider different aspects of signal processing that can be applied to emerging wireless and access systems. In the first of these papers Walsh-chirp sequences for wireless applications Wysocki, Wysocki, and Zepernick, describe the new class of poly-phase spreading sequences having a potential for reducing multi-access interference in direct sequence code division multiple access (CDMA) wireless data networks. The second of these papers Memory truncation and crosstalk cancellation for efficient Viterbi detection in FDMA systems by Mertins introduces the new method to design transmission systems for frequency division multiple access (FDMA) over frequency selective channels. The proposed method can be successfully applied to discrete multitone modulation (DMT) or to orthogonal frequency division multiplexing (OFDM) as well as to CDMA. Then, Bourdel, Campo, Melet, and Andrieux present a design path for a chipset to be used in wireless data CDMA transceiver in their paper *From modelling of a CDMA transceiver in indoor environment to an ASIC circuit synthesis*. The series concludes with the paper *Simulating capture behaviour in 802.11 radio modems* where Ware, Wysocki, and Chicharo introduce a new model describing the operation of an 802.11 receiver. That new model is able to reflect the fairness characteristics obtained with an IEEE 802.11 radio modem more accurately than the previous capture models.

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The next two papers *Error statistics for concatenated systems on non-renewal time-varying channels* by Pimentel and *Stop criteria for retransmission termination in soft-combining algorithms* by Zepernick and Caldera are concerned with improving transmission quality by applying different error-control strategies.

The final paper of the issue *Precise measurement of complex permittivity of materials for telecommunications devices* by Nakamura and Nikawa is concerned with application of signal processing for measuring parameters of materials used for design of telecommunication devices.

The Guest Editor wish to thank the numerous reviewers who have volunteered their precious time in order to provide feedback to the authors and to improve quality of the issue. He would also like to express his gratitude to the contributors and to the Editorial Office of the Journal for the valued assistance in bringing this issue to fruition.

Tadeusz Antoni Wysocki
Guest Editor