

ERROR-RESILIENT TRANSMISSION OF WAVEFORM SIGNALS USING OVERCOMPLETE EXPANSIONS AND SOFT-INPUT SOURCE DECODING

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ABSTRACT

In this paper we present a new approach for robust transmission of waveform signals over noisy channels, where explicit symbol-based redundancy is added to the source signal for error protection by using an overcomplete block transform prior to quantization. This approach is in contrast to commonly used schemes for joint source-channel coding which employ binary channel encoding after the quantization stage. At the decoder, a soft-input soft-output source decoding approach is applied, which allows us to efficiently exploit the explicit redundancy introduced in the continuous amplitude domain. The performance of the proposed approach is evaluated for different code constructions based on the DFT, the DCT, and the discrete Hadamard transform.