

## Choosing the right threshold for cross-entropy-based stopping criteria

### ABSTRACT

Cross-entropy (CE)-based stopping criteria for turbo iterative decoding are known to outperform fixed-iteration stopping criteria at high signal-to-noise ratios (SNRs). While CE-based stopping criteria have a range of thresholds, a high-value threshold for small frame sizes, and vice versa, should be used. It is difficult to advocate the value that can be categorized as either a small or large frame size. Moreover, thresholds may be specific for different SNRs. Hence, this paper provides a systematic analysis of threshold selection for the respective frame sizes of well-known CE-based stopping criteria. In this work, a range of thresholds was simulated for their error performance and required average number of iterations. To reduce complexity in the average iteration number, these results are thoroughly analysed and a suitable threshold for each CE-based stopping criterion in the specific SNR region is proposed.

**Keyword:** Cross-entropy; Stopping criteria; Turbo codes; Iterative decoding