SOFT OUTPUT VITERBI TURBO DECODING FOR WIRELESS MEDICAL DEVICES

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In modern digital communication systems, an error correction coding of digital signals is used to improve energy efficiency and correct errors. Note, that wireless technology gives us significant innovative services in the healthcare sector, enabling us to use different medical devices. From hospital-wide cellular networks, providing continuous reliable monitoring of patients, to personal medical devices used in the home, wireless connectivity provides benefits to patients and medicians. That technology is developing in the form of Bluetooth, ZigBee, Wi-Fi, and Ultra Wide Band. Data reliability is an important issue for all these standards, which is being decided by efficient error correction method [1, 2].

In recent years an important achievement in the theory of error correction coding for wireless data transmission is convolutional turbo codes. For their decoding, scientists Hagenauer and Hoeher proposed a bitwise soft output Viterbi decoding method (SOVA) [3]. Further development is associated with the work of Chen, Fossorier, Lin, and Xu, who proposed a bidirectional modification of SOVA [4]. The *aim* of this work is to analyze this decoding method.

The SOVA decoding consists of using edge metrics and a block of add-compare-select operations. For the obtained maximal likelihood path an approximation on a trellis with a sliding window of size δ is used. The bidirectional SOVA is performed forward and backward on the trellis for each bit. General a posteriori decision is chosen according to the larger magnitude of forward of backward SOVA decision. The end of the decoding process occurs either after the specified number of iteration cycles is performed, or after the value of the decoding result according to a certain stop criterion reaches a set threshold [2, 5].

So, the skilful use of the given decoding method will allow us to obtain good results for communication systems, including wireless medical diagnostic devices.

References:

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