

Abstract

NEURAL NETWORK CONVOLUTIONAL CODE DECODER

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In this thesis the use of Artificial Neural Networks for Convolutional Code Decoding is investigated. We considered two types of Neural Networks (NN); traditional NNs, which required training and a novel concept of NNs which do not require training. The former was trained using source and channel data and a modification of the Maximum a Posteriori (MAP) algorithm. The latter was adapted to implement the Viterbi decoding algorithm with and without Punctured Convolutional coding, and the Trellis Coded Modulation (TCM) decoding algorithm. In each case, the performance is compared with uncoded Binary Phase Shift keying (BPSK). We find that the novel NN implementations provide the same performance as the standard soft-decision decoding algorithm. Furthermore, we find the use of standard NNs unsuitable for decoding convolutional codes.