

NON-LINEAR ENCODER AND DECODER FOR INFORMATION TRANSMISSION THROUGH NON-LINEAR CHANNELS

Abstract

In order to mitigate against the multiplicative noise effects caused by
5 known non-linearities in a trellis coded data transmission system, a signal
constellation is formed by starting with a base constellation whose number
of signal points and whose geometry are selected in accordance with conventional
criteria and then warping that constellation (in 130) by adjusting the positions of its
10 signal points in accordance with a warp function which is the inverse of the known
component of the non-linear characteristic of the transmission system. Because the
constellation warping is deterministic, it is possible for the receiver to "unwarp" the
received signal points prior to applying them to the Viterbi decoder. In
preferred embodiments, the trellis code is of a type in which the dominant error
event is a trellis path error.

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