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(54) **NEURAL NETWORK SOFT INFORMATION DETECTOR IN A READ CHANNEL**

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(57) **ABSTRACT**

Example systems, read channels, and methods provide bit value detection from an encoded data signal using a neural network soft information detector. The neural network detector determines a set of probabilities for possible states of a data symbol from the encoded data signal. A soft output detector uses the set of probabilities for possible states of the data symbol to determine a set of bit probabilities that are iteratively exchanged as extrinsic information with an iterative decoder for making decoding decisions. The iterative decoder outputs decoded bit values for a data unit that includes the data symbol.