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(19) **United States**(12) **Patent Application Publication** (10) **Pub. No.: US 2022/0399903 A1**
HUANG et al. (43) **Pub. Date: Dec. 15, 2022**(54) **DECODING METHOD ADOPTING
ALGORITHM WITH WEIGHT-BASED
ADJUSTED PARAMETERS AND DECODING
SYSTEM**(52) **U.S. CL.**
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A decoding method adopting an algorithm with weight-based adjusted parameters and a decoding system are provided. The decoding method is applied to a decoder. $M \times N$ low density parity check codes (LDPC codes) having N variable nodes and M check nodes are generated from input signals. In the decoding method, information of the variable nodes and the check nodes is initialized. The information passed from the variable nodes to the check nodes is formed after multiple iterations. After excluding a connection to be calculated, a product of the remaining connections between the variable nodes and the check nodes is calculated. Next, an estimated first minimum or an estimated second minimum can be calculated with multi-dimensional parameters. The information passed from the check nodes to the variable nodes can be updated for making a decision.

