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Simulating Low-Density Parity Check Codes Abstract

All communication channels are subject to corruption, which can have implications on how high performance technology transmits data. The need for efficient and accurate encoding and decoding has inspired new methods of protecting data. Low-density parity-check codes (LDPCs) incorporate sparse redundancy to protect the original message bits without incurring too much decoding complexity. We seek to empirically show whether LDPC schemes designed deterministically improve upon the accuracy of LDPC schemes designed using randomization. A binary erasure channel was programmed using Python 3 to simulate three classes of LDPCs: Gallager, MacKay Neal, and a unique method developed throughout the course of this research. We compare and report the accuracy of the three classes in recovering an original message from a corrupted message.