

# Rate-Distortion without Random Codebooks

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*Abstract*—In this paper we pose a rate-distortion problem whose solution differs from Shannon's. We solve an instance of the problem for Bernoulli strings based on the following idea: The data string is parsed into segments of length  $k$ . For a desired distortion a set of strings of length  $k$  is selected, called a 'flipping' set. When scanning through the data string an occurrence of a segment in the flipping set is found all the low probability symbols in all the occurrences of the segment are flipped to the opposite symbol. We find an optimal flipping set, which for the desired distortion gives the smallest rate. The resulting discrete rate-distortion function falls on a convex curve connecting the entropy of the Bernoulli source for zero-distortion and the zero rate at the point where the distortion is the lower probability.