

Extremely Lossy Compression through Reinforcement Learning

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1 Introduction

Lossless compression mandates original data be perfectly reconstructed, but is limited by data entropy. To compress further, information content must be sacrificed. Therefore, lossy compression minimizes the loss for a specific bitrate. But which content should be discarded? Early image compression loss-functions, like L_2 -loss, give each pixel equal value. However, some parts retain more valuable information than others. Research has hand-crafted improved metrics, like MS-SSIM, but defining these is task-specific. Ultimately, achieving the most extreme forms of compression requires task-dependent methods to quantify information value, preserving only the minimum required to complete the task. However, general methods for this process would be useful. This facilitates a natural transition into the reinforcement learning space, where agents act on an environment to maximize rewards. The goal of this research is to define a method through which data is compressed such that the agent can maximize the reward in the reconstructed environment.

2 Related Works

3 Methods

4 Experiments and Evaluation

5 Discussion

References