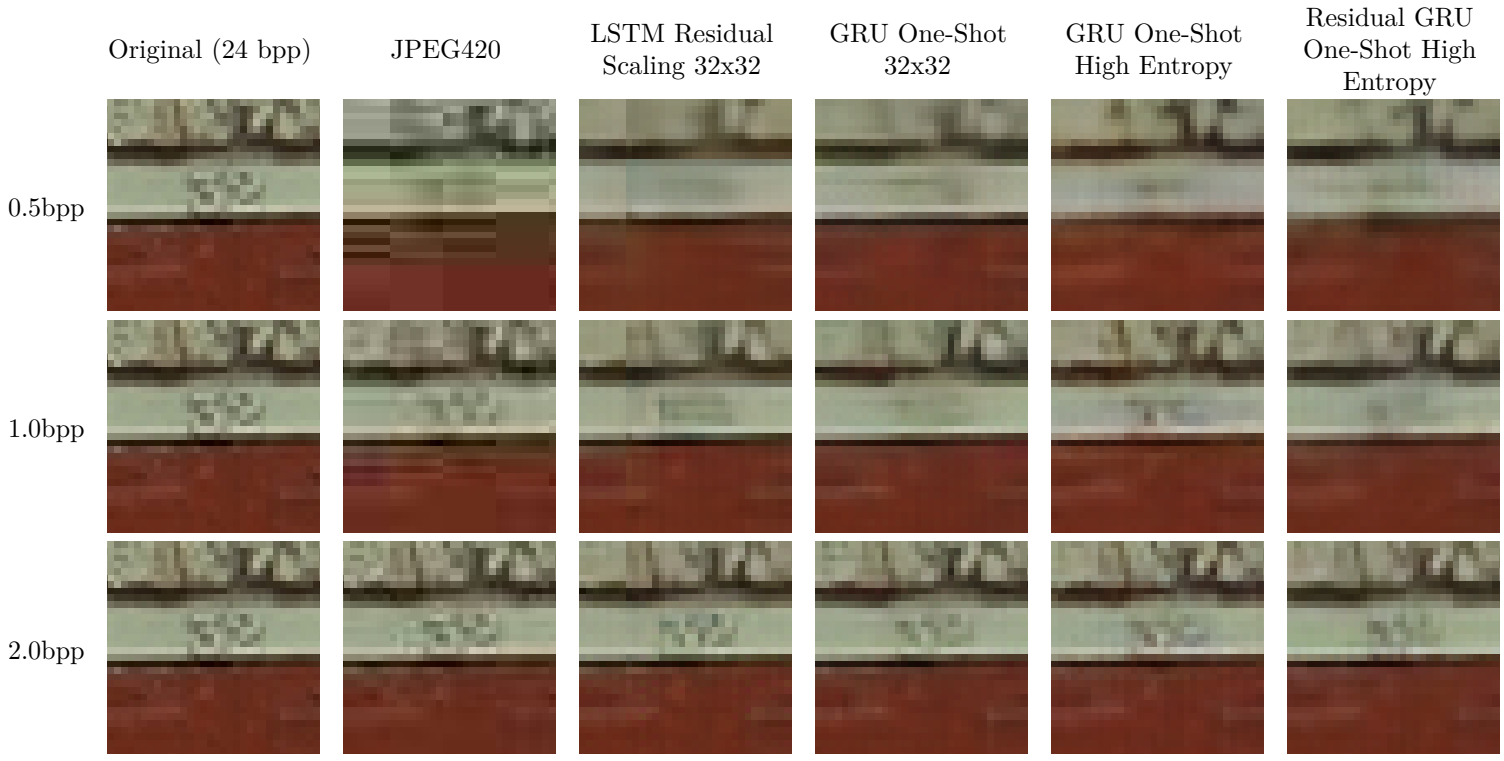
A Supplementary Materials

We include a sample of images from the Kodak dataset, to compare JPEG with the compression of our network at various bitrates. On the first page of each subsection, we show the full original image followed (at the bottom of that page) by a detailed crop area. The cropped areas are shown for the different approaches under consideration and for multiple bitrates. The approaches shown, to the right of the original cropped image, are: JPEG 420, LSTM Residual Scaling (trained on the 32x32 dataset), GRU One-shot (trained on the 32x32 dataset), GRU One-shot (trained on the high-entropy dataset), and Residual GRU One-shot (trained on the 32x32 dataset). The (nominal) bitrates shown are: 0.5 bits per pixel (bpp), 1.0 bpp, and 2.0 bpp.

The remaining pages of each subsection show the complete images, compressed using these different approaches at those same bitrates. This comparison will be biased towards JPEG, since we do use nominal bitrates on our results and we do not include the header size in the JPEG evaluation. Our nominal bitrates do not include entropy coding, so our final bitrates will actually be lower than those quoted here. Based on experiments, the final bitrate will be about about 15% lower than the nominal bitrate at 0.5 bpp and about 5% lower at 2 bpp. We also do not count the JPEG header size in our search for the best JPEG setting for these bitrates, so the final JPEG bitrates will be slightly higher than what is quoted here.

A.1 Kodak Image 1



A.1.1 JPEG420 at 0.5 bpp

A.1.2 LSTM Residual Scaling 32x32 at 0.5 bpp

A.1.3 GRU One-Shot 32x32 at 0.5 bpp

A.1.4 GRU One-Shot High Entropy at 0.5 bpp

A.1.5 Residual GRU One-Shot High Entropy at 0.5 bpp

A.1.6 JPEG420 at 1.0 bpp

A.1.7 LSTM Residual Scaling 32x32 at 1.0 bpp

A.1.8 GRU One-Shot 32x32 at 1.0 bpp

A.1.9 GRU One-Shot High Entropy at 1.0 bpp

A.1.10 Residual GRU One-Shot High Entropy at 1.0 bpp

A.1.11 JPEG420 at 2.0 bpp

A.1.12 LSTM Residual Scaling 32x32 at 2.0 bpp

A.1.13 GRU One-Shot 32x32 at 2.0 bpp

A.1.14 GRU One-Shot High Entropy at 2.0 bpp

A.1.15 Residual GRU One-Shot High Entropy at 2.0 bpp

A.2 Kodak Image 8

A.2.1 JPEG420 at 0.5 bpp

A.2.2 LSTM Residual Scaling 32x32 at 0.5 bpp

A.2.3 GRU One-Shot 32x32 at 0.5 bpp

A.2.4 GRU One-Shot High Entropy at 0.5 bpp

A.2.5 Residual GRU One-Shot High Entropy at 0.5 bpp

A.2.6 JPEG420 at 1.0 bpp

A.2.7 LSTM Residual Scaling 32x32 at 1.0 bpp

A.2.8 GRU One-Shot 32x32 at 1.0 bpp

A.2.9 GRU One-Shot High Entropy at 1.0 bpp

A.2.10 Residual GRU One-Shot High Entropy at 1.0 bpp

A.2.11 JPEG420 at 2.0 bpp

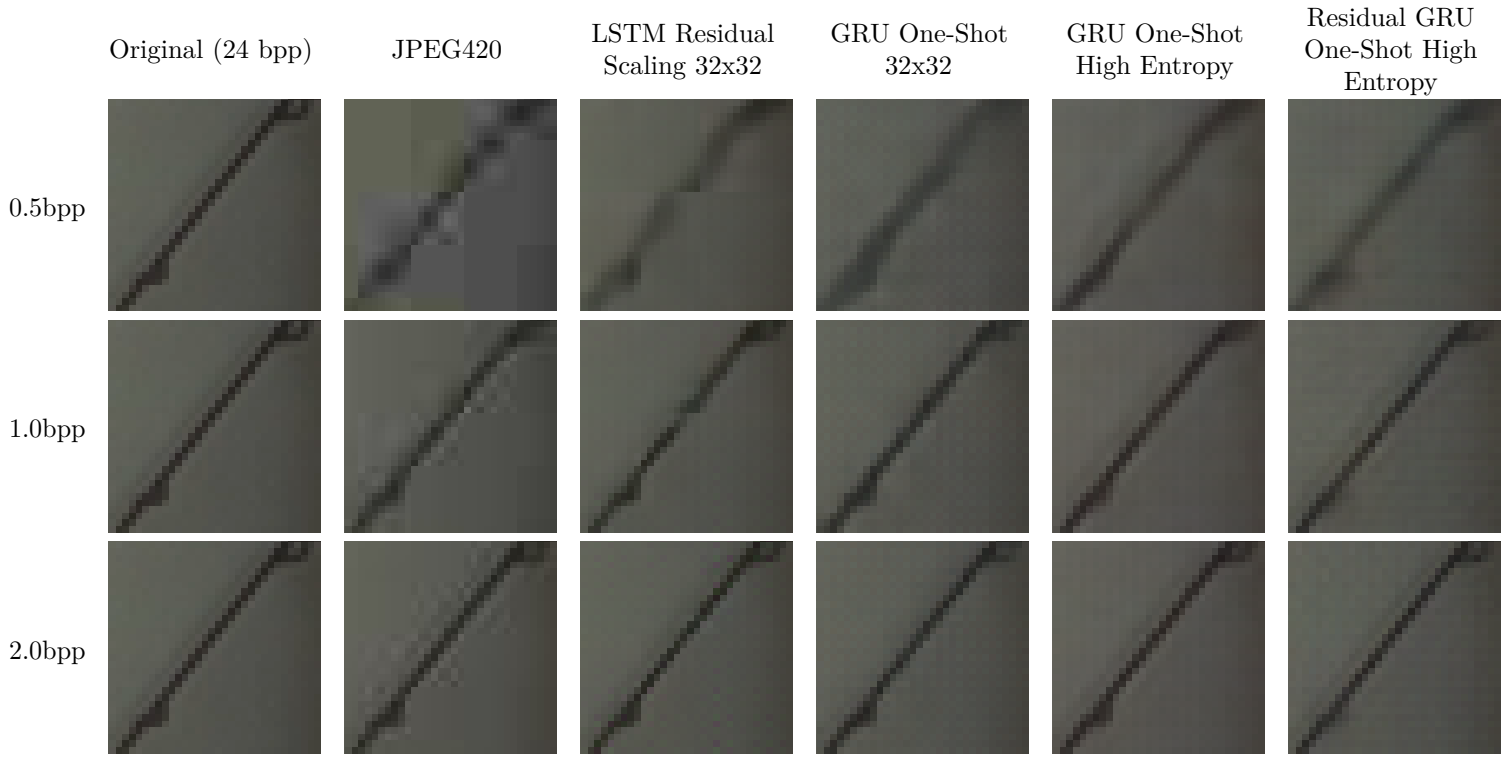
A.2.12 LSTM Residual Scaling 32x32 at 2.0 bpp

A.2.13 GRU One-Shot 32x32 at 2.0 bpp

A.2.14 GRU One-Shot High Entropy at 2.0 bpp

A.2.15 Residual GRU One-Shot High Entropy at 2.0 bpp

A.3 Kodak Image 24



A.3.1 JPEG420 at 0.5 bpp

A.3.2 LSTM Residual Scaling 32x32 at 0.5 bpp

A.3.3 GRU One-Shot 32x32 at 0.5 bpp

A.3.4 GRU One-Shot High Entropy at 0.5 bpp

A.3.5 Residual GRU One-Shot High Entropy at 0.5 bpp

A.3.6 JPEG420 at 1.0 bpp

A.3.7 LSTM Residual Scaling 32x32 at 1.0 bpp

A.3.8 GRU One-Shot 32x32 at 1.0 bpp

A.3.9 GRU One-Shot High Entropy at 1.0 bpp

A.3.10 Residual GRU One-Shot High Entropy at 1.0 bpp

A.3.11 JPEG420 at 2.0 bpp

A.3.12 LSTM Residual Scaling 32x32 at 2.0 bpp

A.3.13 GRU One-Shot 32x32 at 2.0 bpp

A.3.14 GRU One-Shot High Entropy at 2.0 bpp

A.3.15 Residual GRU One-Shot High Entropy at 2.0 bpp