

DeepN-JPEG: A Deep Neural Network Favorable JPEG-based Image Compression Framework

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Introduction

- Human visual based approach like JPEG is not an optimized approach for Deep Neural Networks.
- New compression framework for deep neural net applications - DeepN-JPEG
- Experiments on ImageNet dataset shows compression ratios of approx. 3.5 x higher compression rate over JPEG

- DeepN-JPEG preserves important features crucial for DNN classification.
- Neural nets treat all frequency components equally while human visual system (HVS) focuses more on low frequency information.
- Key step of DeepN-JPEG is to redesign HVS inspired quantization table to be DNN favorable.
- Quantization table redesign is a intractable optimization problem because of complexity of parameter search.

JPEG

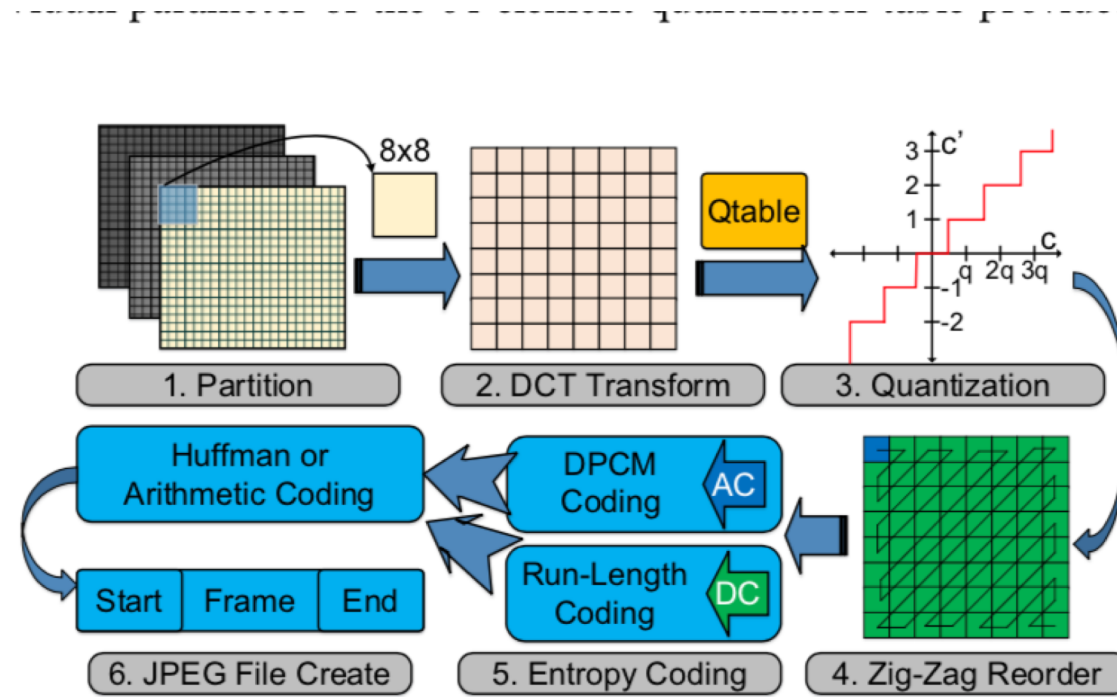
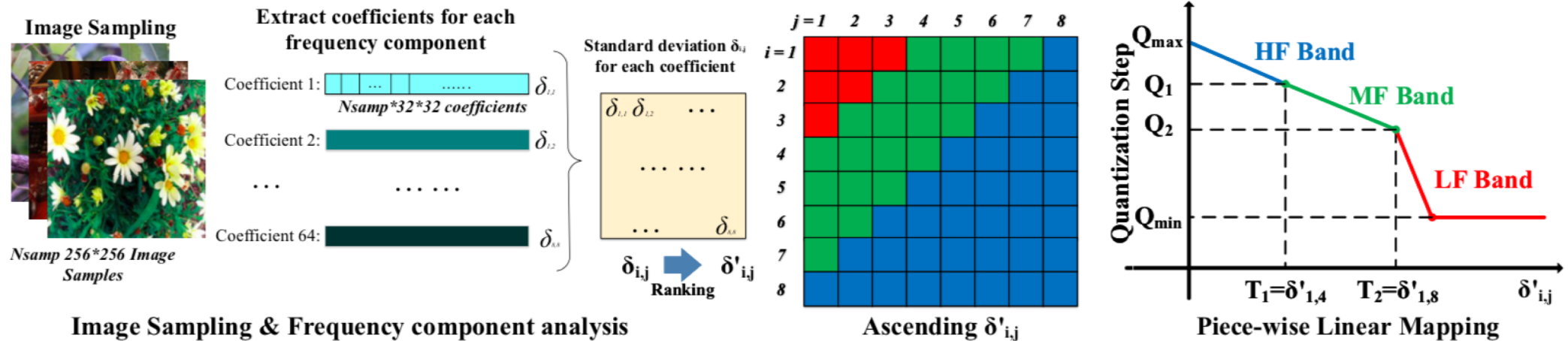


Figure 1: Briefly overview of JPEG compression technology .

Design flow of DeepN-JPEG



Results

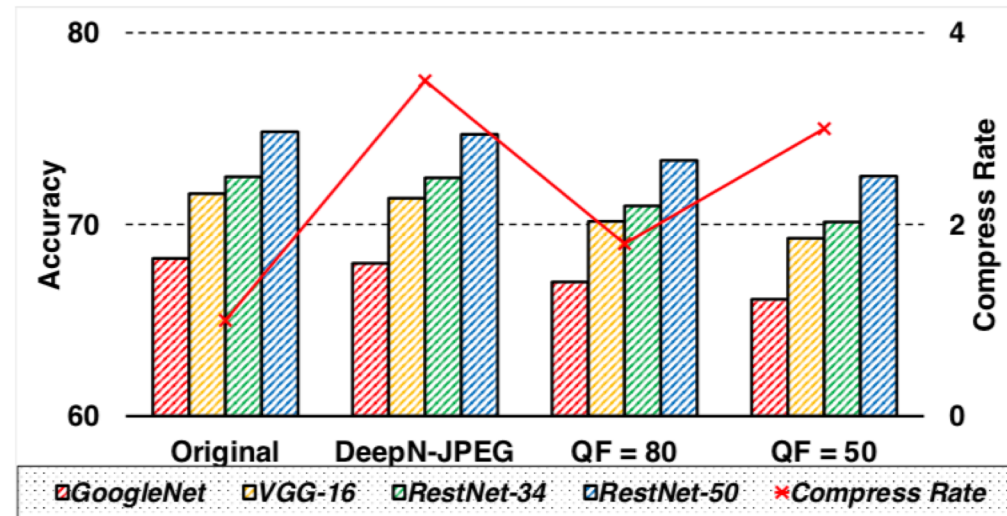


Figure 8: The compress rate and accuracy for different DNN models.