Compression Algorithms and AI Models

Tested On Images

Algorithm methods

Algorithms

Sparse Coding

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Mainly for classification through low resolution data and doesn't care about small data.
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Sparse coding is a technique where a signal is represented as a linear combination of a few basis functions from a predefined dictionary. The key idea is to enforce sparsity in the coefficients, meaning that most coefficients are zero.

Dictionary Learning

Dictionary learning aims to find an overcomplete dictionary and sparse representations of data in terms of this dictionary. It adapts the dictionary to better represent the input data, allowing for more flexible and adaptive representations.

Algorithms

PCA

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you have a big data and wanna understand the
main direction of components inside the data
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PCA is a linear dimensionality reduction technique that finds the principal components of the data. These components capture the directions of maximum variance, and by selecting a subset of them, the data can be projected into a lower-dimensional space.

Lossless

Grouping repeated bits in sequences. Instead of writing 1 1 1 1, we shall write 4 1.

AI methods

Algorithms

Autoencoder

An autoencoder is a neural network that learns a compact representation of data by encoding it into a lower-dimensional space and then decoding it back to the original space. It consists of an encoder and a decoder.

Lossy Data Compression

Lossy data compression involves discarding some information from the data to achieve higher compression ratios. Techniques like quantization and approximation are used, leading to a loss of fidelity in the reconstructed data.

Algorithms

Lossy Data Compression

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Convert TF model to C

tflite_sinewave_training

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github