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(54) Title: MACHINE LEARNING TECHNIQUES FOR VIDEO DOWNSAMPLING

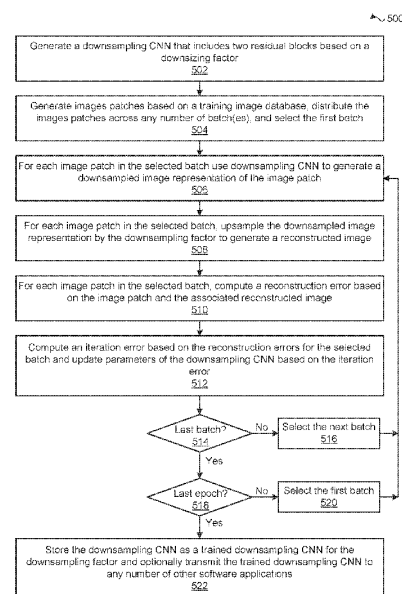


FIGURE 5

(57) Abstract: In various embodiments, a training application trains a convolutional neural network to downsample images in a video encoding pipeline. The convolutional neural network includes at least two residual blocks and is associated with a downsampling factor. The training application executes the convolutional neural network on a source image to generate a downsampled image. The training application then executes an upsampling algorithm on the downsampled image to generate a reconstructed image having the same resolution as the source image. The training application computes a reconstruction error based on the reconstructed image and the source image. The training application updates at least one parameter of the convolutional neural network based on the reconstruction error to generate a trained convolutional neural network. Advantageously, the trained convolutional neural network can be implemented in a video encoding pipeline to mitigate visual quality reductions typically experienced with conventional video encoding pipelines that implement conventional downsampling techniques.

[Continued on next page]

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