quality version of the video stream before having finished downloading / buffering the whole stream, with the consequence that the decoder device will have to download also segments of the signal that will be never played back (with consequent waste of time and bandwidth).

In addition, current algorithms and transmission formats aren't engineered for best usage of the available bandwidth in the case of constant bit rates (CBR), with the consequence that they must encode the signal so that the images that contain the most information don't exceed the constant bit rate (with consequent lower usage of the CBR for all of the other images).

Lastly, traditional MPEG family codecs are structurally non-parallel. This stems from the fact that they are block-based, and each image block must be encoded and decoded sequentially, since to achieve efficient compression, all blocks must be made to depend in some way on each other. As a consequence, also the bitstream is not organized so as to allow for parallel decoding by many independent computing cores/devices.

Such limitations are true for video streaming (2D or multiview), but also carry over to other areas of application that are becoming increasingly important, such as the efficient transmission of 3D or volumetric imaging, which is becoming more and more important in fields such as medical imaging, scientific imaging, etc.

BRIEF DESCRIPTION

Embodiments herein deviate with respect to conventional systems and methods. For example, embodiments herein are directed to unique ways of using reconstruction data to reconstruct renditions of a signal at one or more different levels of quality.

More specifically, one embodiment herein includes a method comprising:

retrieving reconstruction data and metadata, the retrieved reconstruction data and metadata being a subset of available data selected from a repository for distribution to a decoder, the retrieved reconstruction data encoded in accordance with a tiered hierarchy including multiple available levels of quality in which portions of a signal are encoded;

transmitting the retrieved reconstruction data to a decoder, the decoder configured to reconstruct renditions of the signal based on the transmitted reconstruction data; and

during the transmission, varying a level of quality of the reconstruction data retrieved and transmitted to the decoder.

Another embodiment includes computer-readable storage hardware having instructions stored thereon, the instructions, when carried out by a processing device, causing the processing device to perform operations of:

retrieving reconstruction data from a repository, the retrieved reconstruction data encoded in accordance with a tiered hierarchy including multiple available levels of quality in which portions of a signal are encoded;

transmitting the retrieved reconstruction data to a decoder, the decoder configured to reconstruct renditions of a signal based on the transmitted reconstruction data; and

during the transmission, varying a level of quality of the reconstruction data retrieved from the tiered hierarchy and transmitted to the decoder.

Yet a further embodiment includes a computer system comprising:

a processor including processing hardware;

a hardware storage unit that stores instructions associated with an application executed by the processor; and

an interconnect coupling the processor and the hardware storage unit, causing the processing hardware to execute the application and perform operations of:

retrieving reconstruction data from a repository, the retrieved reconstruction data encoded in accordance with a tiered hierarchy including multiple available levels of quality in which portions of the signal are encoded;

transmitting the retrieved reconstruction data to a decoder, the decoder configured to reconstruct renditions of the signal based on the transmitted reconstruction data; and

during the transmission, varying a level of quality of the reconstruction data retrieved from the tiered hierarchy and transmitted to the decoder.

Also disclosed herein is a signal processor configured to retrieve reconstruction data from a repository. The reconstruction data is encoded in accordance with a tiered hierarchy including multiple levels of quality. The signal processor transmits selected portions of the reconstruction data to a decoder resource. The decoder resource reconstructs renditions of a signal based on the transmitted portions of reconstruction data. During the step of

transmitting, the signal processor retrieving the reconstruction data from the repository varies a level of quality of the reconstruction data