Sample Array Coding for Low-Delay

Abstract

Disclosed is a decoder for reconstructing a sample array from an entropy encoded data stream. The decoder is configured to entropy decode a plurality of entropy slices within the entropy encoded data stream so as to reconstruct different portions of the sample array associated with the entropy slices, respectively. Each entropy slice may have entropy encoded therein data for a corresponding portion of the sample array. Each of the different portions may form a respective row of blocks of the sample array with the blocks being regularly arranged in rows and columns so that the portions corresponding to the entropy slices consist of the same number of blocks. The entropy slices are subdivided into chunks and the entropy decoding the plurality of entropy slices comprises (i) performing, for each entropy slice, the entropy decoding along a respective entropy coding path using respective probability estimations, wherein the entropy coding path points in parallel along the rows of the blocks, (ii) adapting the respective probability estimations along the respective entropy coding path using a previously decoded part of the respective entropy slice, (iii) starting the entropy decoding the plurality of entropy slices sequentially using an entropy slice order, and (iv) performing, in entropy decoding a predetermined entropy slice, entropy decoding a current part of the predetermined entropy slice based on the respective probability estimations of the predetermined entropy slice as adapted using the previously decoded part of the predetermined entropy slice. This is achieve with (a) storing the probability estimations manifesting themselves after having entropy decoded the second block of the portion corresponding to the predetermined entropy slice for probability estimation initialization before decoding a first block of the portion corresponding to an in entropy slice order succeeding entropy slice along the respective encoding path, (b) checking whether a current chunk corresponds to a first sub-portion of the portion corresponding to the predetermined entropy slice along the entropy coding path, (c) if so, performing an initialization of the probability estimations before decoding the first block of the portion corresponding to the predetermined entropy slice along the respective entropy coding path with probability estimations manifesting themselves after having entropy decoded the second block of the portion corresponding to the in entropy slice order preceding entropy slice along the respective entropy coding path, entropy decoding the current chunk under adapting the respective probability estimations, and leaving unchanged a state of the respective probability estimations as manifesting themselves at an end of the entropy decoding the current chunk for being taken into account when entropy decoding another chunk which corresponds to a second sub-portion of the portion of the predetermined entropy slice along the entropy coding path, and (d) if not, resuming the entropy decoding the

predetermined entropy slice at the current slice by leaving unchanged a state of the respective probability estimations manifesting themselves at an end of entropy decoding a chunk which corresponds to a sub-portion of the portion of the predetermined entropy slice preceding the sub-portion corresponding to the current chunk, along the entropy coding path.

[FIG. 1]