Claims

1. A decoder, the decoder comprising circuitry configured to: receive a bitstream, including a sequence parameter set and a first coded picture;

detect in the sequence parameter set associated with the first coded picture, that a coded sub-picture is present in the first coded picture and a location of the coded sub- picture in the first coded picture;

extract from the first coded picture, and decode, the coded sub-picture to form a reference picture;

determine a predictor from the reference picture using a scaling constant, the scaling constant being determined from information in the bitstream; and

use the predictor to decode a subsequent picture in the bitstream.

2. A decoder, the decoder comprising circuitry configured to:

receive a bitstream including a sequence parameter set and a first coded picture;

detect in the sequence parameter set associated with the first coded picture, the location of a first coded sub-picture in the first coded picture and the location of a second coded sub-picture in the first coded picture;

extract and decode the first coded sub-picture to form a first reference picture;

extract and decode the second coded sub-picture to form a second reference picture;

determine a first predictor in the first reference picture using a first scaling constant determined from information in the bitstream; and

determine a second predictor in the second reference picture using a second scaling constant determined from information in the bitstream.

3. A method of video decoding, the method comprising:

receiving, by a decoder, a bitstream, including a sequence parameter set and a first coded picture;

detecting, by the decoder, in the sequence parameter set associated with the first coded picture, that a coded sub-picture region is present in the first coded picture and a location of the coded sub-picture region in the first coded picture;

extracting, by the decoder, the coded sub-picture region from the first coded picture to form a decoded independent picture that is used as a reference picture;

determining, by the decoder, a predictor from the reference picture using a scaling constant, the scaling constant being determined from information in the bitstream; and

using, by the decoder, the predictor to decode a subsequent picture in the bitstream.

4. The decoder of claim 1, wherein the information in the bitstream used to obtain the scaling constant includes an index.

5. The decoder of claim 1, wherein the predictor is formed using an interpolation filter.

6. The decoder of claim 1, wherein the subsequent picture is a subsequent independent sub-picture.

7. The decoder of claim 2, wherein the predictor is determined using a motion vector candidate list.

8. The decoder of claim 2, wherein the first predictor is used to decode a first subsequent picture.

9. The decoder of claim 8, wherein the second predictor is used to decode a second subsequent picture.

10. The decoder of claim 9, wherein the first and second subsequent pictures are sub-pictures extracted from the same picture.

11. A decoder, the decoder comprising circuitry configured to:

receive a bitstream including a sequence parameter set and a first coded picture;

detect in the sequence parameter set associated with the first coded picture, that a coded sub-picture is present in the first coded picture and a location of the coded sub- picture in the first coded picture;

extract from the first coded picture, and decode, the coded sub-picture to form a reference picture;

determine a predictor in the reference picture using a scaling constant obtained from information in the bitstream, the information including an index; and

use the predictor to decode a subsequent picture.