

CLAIMS

What is claimed is:

1. A method of aligning across layers in a coded video stream, executable by a processor, comprising:
 - decoding a video bitstream having multiple layers;
 - identifying one or more subpicture regions from among the multiple layers of the decoded video bitstream, the subpicture regions comprising a background region and one or more foreground subpicture regions;
 - decoding and displaying an enhanced subpicture based on a determination that a foreground subpicture region is selected; and
 - decoding and displaying the background region based on a determination that a foreground subpicture region was not selected.
2. The method of claim 1, further comprising:
 - selecting a subset of the layers from among the multiple layers, based on bandwidth; and
 - transmitting the selected subset of layers.
3. The method of claim 1, wherein in-loop filtering is disabled across boundaries between the layers.
4. The method of claim 1, wherein motion compensated prediction or intra-block copy is disabled across boundaries between the layers.
5. The method of claim 1, further comprising:
 - processing boundary padding for motion compensated prediction or in-loop filtering at boundaries of the subpicture regions.
6. The method of claim 1, wherein layout information of subpicture regions is signaled by parameter set data.

7. The method of claim 6, wherein the layout information comprises a size and a position associated with the subpicture regions.
8. The method of claim 6, wherein one or more of the subpicture regions may be relocated and displayed based on the layout information.
9. The method of claim 1, wherein each subpicture region may be coded as an independent layer corresponding to a local region having a unique layer identification value.
10. The method of claim 9, wherein each of the subpicture regions corresponding to the independent layers has a unique picture order count value within an access unit.
11. A computer system for aligning across layers in a coded video stream, the computer system comprising:
 - one or more computer-readable non-transitory storage media configured to store computer program code; and
 - one or more computer processors configured to access said computer program code and operate as instructed by said computer program code, said computer program code including:
 - first decoding code configured to cause the one or more computer processors to decode a video bitstream having multiple layers;
 - identifying code configured to cause the one or more computer processors to identify one or more subpicture regions from among the multiple layers of the decoded video bitstream, the subpicture regions comprising a background region and one or more foreground subpicture regions;
 - second decoding and first displaying code configured to cause the one or more computer processors to decode and display an enhanced subpicture based on a determination that a foreground subpicture region is selected; and
 - third decoding and second displaying code configured to cause the one or more computer processors to decode and display the background region based on a determination that a foreground subpicture region was not selected.

12. The computer system of claim 11, further comprising:
selecting code configured to cause the one or more computer processors to select a subset of the layers from among the multiple layers, based on bandwidth; and
transmitting code configured to cause the one or more computer processors to transmit the selected subset of layers.
13. The computer system of claim 11, wherein in-loop filtering is disabled across boundaries between the layers.
14. The computer system of claim 11, wherein motion compensated prediction or intra-block copy is disabled across boundaries between the layers.
15. The computer system of claim 11, further comprising:
processing code configured to cause the one or more computer processors to process boundary padding for motion compensated prediction or in-loop filtering at boundaries of the subpicture regions.
16. The computer system of claim 11, wherein layout information of subpicture regions is signaled by parameter set data.
17. The computer system of claim 16, wherein one or more of the subpicture regions may be relocated and displayed based on the layout information.
18. The computer system of claim 11, wherein each subpicture region may be coded as an independent layer corresponding to a local region having a unique layer identification value.
19. The computer system of claim 18, wherein each of the subpicture regions corresponding to the independent layers has a unique picture order count value within an access unit.

20. A non-transitory computer readable medium having stored thereon a computer program for aligning across layers in a coded video stream, the computer program configured to cause one or more computer processors to:

decode a video bitstream having multiple layers;

identify one or more subpicture regions from among the multiple layers of the decoded video bitstream, the subpicture regions comprising a background region and one or more foreground subpicture regions;

decode and display an enhanced subpicture based on a determination that a foreground subpicture region is selected; and

decode and display the background region based on a determination that a foreground subpicture region was not selected.