ABSTRACT

MPEG-2 compatible stereoscopic 3D-video image digital decoding method and system, using its own coding algorithm. In order to obtain 3D-images from a digital video stream, modifications have been made to the current MPEG2 decoders, by means of software and hardware changes in different parts of the decoding process. Namely, the video_sequence structures of the video data stream are modified via software to include the necessary flags at the bit level of the image type in the TDVision® technology; the modifications are made in the decoding processes as well as in decoding the information via software and hardware, where a double output buffer is activated, a parallel and differences decoding selector is activated, the decompression process is executed, the corresponding output buffer is displayed; the decoder must be programmed via software to simultaneously receive and decode two independent program streams, each with an TDVision® stereoscopic identifier.

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CLAIMS

1. A stereoscopic 3D-video image digital decoding system and method, in which the structures of the video_sequence of the video data stream are modified via software, to include the necessary flags at the bit level for the image type, characterized by only modifying the software and by using the user_data() section to store the error correction which allows to regenerate the stereoscopic video signal, thereby actually identifying the video format; applying a logical "and" for MPEG2 backward compatibility in case it is not a TDVision® video; typically decoding by scanning the video_sequence; when the image is a TDVision® image:

a) storing the last complete image buffer in the left or right channel buffer.

b) applying the differences or parallel decoding for B type frame information,

c) applying error correction to the last image obtained by applying the motion and color correction vectors,

d) storing the results in their respective channel buffer,

e) continuing with the video_sequence reading.

2. Stereoscopic 3D-video image digital decoding method and system, in which the video_sequence structures of the video data stream are modified via software to include the necessary flags at the bit level of the image type according to Claim 1, further characterized by the decoder compilation format being as follows:

a) reading video_sequence ,

b) discriminating the sequence_header, if a TDVision® image is identified, then activating the double buffer,

c) reading in the user_data the image as if it was

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contained in said structure,

d) adding in the sequence_scalable_extension information to the video_sequence MPEG, said information could be contained within said structure,

e) finding in the picture_header the TDVision® image identifier in the extra_bit_picture,

f) reading the "B" type image in the picture_coding_extension, and if it is a TDVision® type image, decoding then the second buffer,

g) if the image is temporarily scalable, applying "B" to the decoder.

3. Stereoscopic 3D-video images digital decoding method and system, in which the structures and the video_sequence of the video data stream are modified to include the necessary flags at the bit level of the image type according to Claim 1, further characterized in that when the decoder detects a user_data() code, it searches the 32-bit 3DVision®_start_identifier = 0x000ABCD identifier, upon detecting this information a call is made to the special decoding function which compares the output buffer and applies it from the current reading offset of the video_sequence.

4. Stereoscopic 3D-video images digital decoding method and system, in which the video_sequence structures of the video data stream are modified via software to include the necessary flags at the bit level of the image type according to Claim 1, further characterized in that the decoder must be programmed via software to simultaneously receive and decode two program streams.

5. Stereoscopic 3D-video images digital decoding method and system, in which the video_sequence structures of the video data stream

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are modified via software to include the necessary flags at the bit level of the image type according to Claim 1, further characterized in that two interdependent video signals can be sent within the same video_sequence; said signals depending one form the other, and coming from a 3DVision® camera; in terms of their algebraic addition (R-L=delta), each signal is stored as a B type frame, which decoding is by differences from one of them.

6. Stereoscopic 3D-video images digital decoding method and system, in which the video_sequence structures of the video data stream are modified via software to include the necessary flags at the bit level of the image type according to Claim 1, further characterized in that two independent video streams L and R are stored in simultaneous form, but being synchronized with the same time_code, and decoded and displayed in parallel.

7. Stereoscopic 3D-video images digital decoding method and system, in which the video_sequence structures of the video data stream are modified via hardware, characterized by the specific use of the structures, substructures and sequences belonging to the video_sequence to implement the MPEG2 backward-compatible TDVision® technology via hardware, in effect, discriminating whether it is a 2S or 3D signal; activating a double output buffer (additional memory); activating a parallel decoding selector, activating a difference- decoding selector; executing the image decompression process, displaying the image in the corresponding output buffer; enabling the PICTURE_DATA3D() function, which is transparent for the compatible MPEG2 readers.

8. Stereoscopic 3D-video images digital decoding method and system, in which the video_sequence structures of the video data stream are modified via hardware according with Claim 7,

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characterized by the specific use of the structures, substructures and sequences belonging to the video_sequence in order to implement the MPEG2 backward-compatible TDVision® technology via hardware:

a) sequence_header

aspect_ratio_information

1001 n/a in TDVision®

1010 4:3 in TDVision®

1011 16:9 in TDVision®

1100 2.21:1 in TDVision®

a logical "and" with 0111 will be executed to obtain backward compatibility with 2D systems, where an instruction is sent to the DSP stating that the stereoscopic pair buffer (left or right) must be equal to the source;

b) frame_rate_code

1001 24,000/1001 (23.976) in TDVision® format

1010 24 in TDVision® format

1011 25 in TDVision® format

1100 30,000/1001 (29.97) in TDVision® format

1101 30 in TDVision® format

1110 50 in TDVision® format

1111 60,000/1001 (59.94) in TDVision® format

a logical "and" with 0111 will be executed to obtain backward compatibility with 2D systems, where an instruction is sent to the DSP stating that the stereoscopic pair buffer (left or right) must be equal to the source;

c) user_data()

sequence_scalable_extension

d) picture_header

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