From: Anthony Joch <anthony@ubvideo.com>
Sent: Wednesday, September 25, 2002 8:11 PM
To: 'Kerofsky, Louis'; jvt-experts@mail.imtc.org
Subject: [jvt-experts] RE: Reference Picture Buffer fragmentation

Louis and experts,

I have also encountered this problem and other similar issues related to picture storage when dealing with a combination of field and frame structured pictures. A decoder implementation would likely choose to store all pictures in one format (either as fields or frames), regardless of the format in which they are coded. For data cache and DMA setup reasons, storage in frame buffers is preferable, at least for some architectures. For field decoding, the row pitch for accessing the frame buffers would simply need to be doubled.

However, I have found that some restrictions are necessary in order to permit the storage of pictures in frame buffers. One restriction I think we may need is that that when referencing in frame pictures, for the short-term buffer, both fields with the same FN(=PN) must be stored, and for the long-term buffer, an LTFI can be referenced only if it stores two fields that originally had the same FN. As well, we would need to limit the number of top and bottom fields in the short term buffer to be equal to the number of reference frames (maybe one additional field is possible in some cases). The long-term buffer currently has such a limitiation, but the short-term buffer does not (see 8.3.6.5). Finally, sliding window mode buffer management would have to include field parity checks when deciding what to remove.

I'm still working out the details of this, but thought now is a good time to raise these issues that are related to the problem that you describe.

Best regards,
Anthony

> -----Original Message-----
> **From:** Kerofsky, Louis [mailto:lkerofsky@sharplabs.com]
> **Sent:** September 25, 2002 10:50 AM
> **To:** Jvt-Experts (jvt-experts@mail.imtc.org)
> **Subject:** [jvt-experts] Reference Picture Buffer fragmentation
>
> Experts,
>
> The operation of the reference picture buffer (8.3.6) is based on decoded pictures. Individual fields can be added and deleted from the reference picture buffer, if they were the result of decoding a field-structured picture. This appears to create a memory fragmentation problem when frame-structured pictures and field-structured pictures are mixed. Consider adding a reference frame-structured picture to the buffer when two reference fields were removed from a full buffer. The fields from frame-structured picture are naturally reconstructed interleaved and should be kept together for efficient implementation of frame-based prediction. The reference buffer may have sufficient space to store two fields but the space may be noncontiguous. Either the fields must be separated or the memory defragmented. Has anyone considered this issue?
>
> Regards,
>
> Louis Kerofsky
>
> ---
> The use of the jvt-experts list is intended only for the video coding standardization work conducted by the Joint Video Team (JVT) of ISO/IEC JTC1/SC29/WG11 (MPEG) and ITU-T SG16 Q.6 (VCEG).

Nokia Exhibit 2251
Amazon.com, Inc., et al. v. Nokia Technologies OY
IPR2024-00572, U.S. Patent No. 7,724,818
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Nokia Exhibit 2251
Amazon.com, Inc., et al. v. Nokia Technologies OY
IPR2024-00572, U.S. Patent No. 7,724,818
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