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Title : Loop Filtering on 16x16 Luminance Blocks

Background

As shown in Document No.423, we could improve RM6 with loop filtering on 16x16 luminance blocks. We found that this improvement is noticeable in the case of RM8 implementations. For instance, our latest document (Doc.#524), reported as our result of RM8 implementation, shows 6.19 in the average luminance RMS error while Doc.#527 (Bellcore implementation) shows 6.76 for the Salesman image sequence. Our investigation on this significant difference between the two results ended up with the finding that our implementation was NOT just RM8 but RM8 with the modification of loop filtering on 16x16 luminance blocks.

The 16x16 luminance block loop filtering scheme, which was proposed to be included in the recommendation, was regarded as being inappropriate because it required additional hardwares and, thus, was turned down. Additional hardwares are necessary in the case of dedicated H/W implementations of video codecs but they are NOT in the case of S/W based implementations. S/W based video codecs easily accommodate the larger luminance block loop filtering scheme by just reprogramming softwares.

Proposal

We, first, propose the capability of 16x16 luminance block loop filtering in the video capabilities of the communication establishment recommendation, AV242, to check the loop filtering capability of video codecs and, next, to modify §3.2.3 in the H.261 to allow 16x16 luminance block loop filtering operations such that any two codecs, if both have such loop filteing capability, can use the capability. Either one of the two codecs has no such capability, both codecs must not use.