Selective Inter-layer Prediction in Scalable Video Coding

Author(s) : Kai Zhang (Institute of Computing Technology, Chinese Academy of Sciences, China)  
Jizheng Xu (Microsoft Research Asia, China)  
Feng Wu (Microsoft Research Asia, China)  
Xiangyang Ji (Institute of Computing Technology, Chinese Academy of Sciences, China)  
Wen Gao (Graduate University of the Chinese Academy of Sciences, China)

Abstract : In the scalable video coding (SVC) standard, spatial scalable coding outperforms simulcast coding when programs with several display resolutions are needed. Nevertheless, it is not suitable for end devices which only need the high resolution, due to a serious performance loss on the high spatial layer compared with single layer coding. To tackle this dilemma, a selective inter-layer prediction (SIP) method is presented in this paper. SIP attains an optimal trade-off by disabling inter-layer prediction on a set of selected frames. Theoretically, this selection can be modeled as a 0–1 knapsack problem which can be solved by dynamic programming.

[continued on the next page]
Selective Inter-layer Prediction in Scalable Video Coding

Author(s): Kai Zhang (Institute of Computing Technology, Chinese Academy of Sciences, China)
Jizheng Xu (Microsoft Research Asia, China)
Feng Wu (Microsoft Research Asia, China)
Xiangyang Ji (Institute of Computing Technology, Chinese Academy of Sciences, China)
Wen Gao (Graduate University of the Chinese Academy of Sciences, China)

Abstract:
Experimental results show that the proposed method can achieve significant gains up to 1 dB on the high spatial layer when the content of the low spatial layer is not needed, and can keep the loss unapparent even when it is. The SIP method has been adopted into the SVC reference software JSVM on the JVT 19th Meeting, held in Geneva.