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論　文　内　容　要　旨

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学位論文題目	Study on key technologies for video coding standard beyond H.265/HEVC (次世代動画像符号化アルゴリズムに関する研究)		

内容要旨

H.265/HEVC is the new next generation video compression standards, which is developed by the ITU-T video coding experts group (VCEG) together with the ISO/IEC moving picture experts group (MPEG). As evaluated by many researchers, the H.265/HEVC standard can achieve much more coding efficiency compared with the previous video compression tools. However, the complexities of the corresponding algorithms have increased the difficulty of implementation. To implement the encoder only in the way of software will exhaust the current general-purpose processor based device, especially for the high resolution, multiview video applications etc. Therefore, high speed, application specified hardware has been acknowledged as a good way of implementation for the H.265/HEVC encoding. This paper studies on the key technology of the next generation video coding. Firstly, a spatio-temporal prediction algorithm is proposed to improve the parallelism of motion estimation in HEVC. Secondly, an efficient motion vector prediction selection algorithm is presented. Thirdly, a fast CU size decision algorithm is presented. The proposed algorithm consists of CU termination and CU skip methods to reduce the redundant computing of inter prediction in HEVC.

After simulation, for proposal 1, experiment results demonstrate that based on HM12.0 test model for different test sequences, the proposed algorithm can improve the advanced motion vector prediction with only 0.01% BD-rate increase that result is better than previous work, and the BDPSNR is almost the same as the HEVC reference software. For proposal 2, the simulation results demonstrate that the proposed overall algorithm can improve the encoding efficiency 5.17%-5.22% on average, and the average complexity increased are 89%-91%, compared with HEVC reference software. Especially for B slice only, the average encoding efficiency of proposed method can significant be raised 10.06%. For proposal 3, the simulation experiment results demonstrate that, specially, in the RA (random-access) case, the average saving coding time is about 53.48% while the BDBR increase is 1.14%, which indicates that the RD performance is similar to HEVC reference software.