



Figure 2. Error concealment effect of football_qcif sequence

5. CONCLUSIONS

Through in-depth analysis, the rate control technology in the H.264 standard was found to be unsuitable for the code rate features required for WSN channel transmission. Therefore, the original rate control algorithm was improved to enhance the stability and controllability of the code rate. The improvement mainly includes modifying the calculation method for QP_{st} and enhancing the effect of the previous GOP on the QP_{st} of the current GOP. Considering the cause of the high bit error rate of WSN channel transmission, the inaccuracy of the SMA was corrected by the BMA, and the secondary error concealment was introduced to overcome the shortcoming of the BMA, aiming to better utilize the completely concealed macroblock information and improve the quality of the reconstructed image. The improved algorithm was proved effective through experiments.

ACKNOWLEDGMENT

This paper is the relevant research result of the Planning Project of the Department of Education "13th Five-Year Plan" Humanities and Social Sciences in Jilin Province in 2018, (Grant No. JJKH20180392SK), and the Planning Project of the Department of Education "13th Five-Year Plan" for Education Science in Jilin Province in 2018 (Grant No. GH180074).

REFERENCES

[1] Armstrong, A., Beesley, S., Grecos, C. (2006). Selection of initial quantisation parameter for rate controlled. H.264 Video Coding Research in Microelectronics and Electronics, 13(6): 249-252.

http://doi.org/10.1109/RME.2006.1689943

[2] Kwon, D.K., Shen, M.Y. (2007). Rate control for h.264 video with enhanced rate and distortion models. IEEE Trans. on Circuits Systems. for Video Techno, 4(7): 517-529. http://doi.org/10.1109/TCSVT.2007.894053

[3] He, Z. (2001). Domainrate-Distortion analysis and rate control for visual coding and communications. Dissertation of University of California Santa Barbara.

[4] Aign, S. (1995). Error concealment enhancement by using the reliability outputs of a SOVA in MPEG-2 video decoder. URSI Int. Symp. Signal Systems and Electronics, pp. 59-62. http://doi.org/10.1109/ISSSE.1995.497934

[5] Chen, T., Zhang, X., Shi, Y.Q. (2005). Error concealment using refined boundary matching algorithm. Information Technology Research and Education, 27(1): 55-59. http://doi.org/10.1109/ITRE.2003.1270571

[6] Zhang, J.L., Wu, C.K., Gao, X.B. (2007). A video error hide algorithm based on double domain Lagrangian interpolation. Electronic Journal, 10(3): 653-658. http://doi.org/10.1109/IIHMSP.2011.93

[7] Shen, L.S., Zhuo, L., Tian, D. (2009). Video coding and low rate transmission. Electronic Industry Press, 12(5): 2-13.

[8] Sun, L.M. (2009). Wireless sensor network. Tsinghua University Press. 2009, 9(5):110-112.

[9] Wang, Y., Zhu, Q.F. (2008). Error control and concealment for video communication. Proceedings of the IEEE. 3(6): 974-977. http://doi.org/10.1109/5.664283

[10] Kim, D., Yang, S., Jeong, J. (2005). A New temporal error concealment method for h.264 using adaptive block sizes. IEEE International Conference on, 38(4): 11-12. http://doi.org/10.1109/ICIP.2005.1530545

[11] Chen, T. (2003). Error concealment using refined boundary matching algorithm. Information Technology, 2(1): 55-59. http://doi.org/10.1109/ITRE.2003.1270571

[12] Yan, B. (2004). A novel motion vector recovery algorithm for error concealment in video transmission. Consumer Communications and Networking Conference, 4(7): 621-623. http://doi.org/10.1109/CCNC.2004.1286934

[13] Park, J., Chul, P.D. (2005). Recovery of image blocks using the method of alternating projections. IEEE Trans. on Image Processing, 13(5): 461-467. http://doi.org/10.1109/TIP.2004.842354

[14] Park, J., Chul, P.D. (2005). Content-based adaptive Spatio-temporal methods for MPEG repair. IEEE Transactions on Image Processing, 5(6): 1066-1077. http://doi.org/10.1109/TIP.2003.822615

[15] Zhang, J., Arnold, J.F., Frater, M.R. (2005). A Cell-loss concealment technique for MPEG-2 coded video. IEEE Transactions on Circuits and Systems for Video Technology, 28(6): 659-665. http://doi.org/10.1109/76.845011

[16] Zhang, J., Zhang, C.T. (2005). Control technology of bitrate in video transmission. Journal of Circuits and Systems, 8(10): 106-110. http://doi.org/10.3969/j.issn.1007-0249.2005.03.023