



REDEFINING MOBILITY



JCT3V-D0194: CE2.h related: Derived disparity vector for 3D-HEVC

Li Zhang, Ying Chen, Marta Karczewicz

Summary

- CU-level NBDV is applied, similar to JCT3V-D0181
- A derived disparity vector is maintained and updated after one CU
 - No need to store the implicit disparity vectors in NBDV process
- Simulation results report 0.12% coding gain for synthesized views

Background

■ NBDV in 3D-HEVC

- Check whether a temporal neighbouring block has a disparity motion vector in pre-defined order
- Check whether a spatial neighbouring block (same as those used in merge) has a disparity motion vector
- Check whether a spatial neighbouring block (same as those used in merge) has an implicit disparity motion vector
 - Implicit disparity motion vector: if one PU uses the DV to derive a merge candidate and the derived candidate is finally selected, the DV is stored and called implicit disparity motion vector

■ Refinement of the DV derived from NBDV

- Access the depth view of coded base-view located by the DV from NBDV and convert one selected depth value to disparity vector (it is called Do-NBDV)

■ Problem

- IDVs may slightly increase the storage

Proposed method

- A single Derived Disparity Vector (DDV) is maintained for the whole slice.
 - At the beginning of decoding one slice, DDV is initialized to be a zero motion vector.
 - After each CU is decoded, the DDV is updated to be the derived disparity vector of that CU.
- Changes to NBDV
 - If no available disparity motion vector is found from the temporal/spatial neighboring blocks, DDV is returned as the result of NBDV.
- Although DDV is used only to generate the result for NBDV, if DoNBDV is enabled, after a CU is coded, the DDV is set to the result of DoNBDV.

Simulation results

■ Results

- Platform: HTM 6.0
- Test conditions: CTC

| | video 1 | video 2 | video PSNR / video bitrate | video PSNR / total bitrate | synth PSNR / total bitrate |
|----------------|---------------|---------------|-------------------------------|-------------------------------|-------------------------------|
| Balloons | 0.1% | -0.1% | 0.0% | 0.0% | 0.0% |
| Kendo | 0.2% | 0.1% | 0.1% | 0.1% | 0.0% |
| Newspapercc | -0.3% | -0.3% | -0.1% | -0.1% | -0.1% |
| GhostTownFly | 0.0% | 0.1% | 0.0% | 0.0% | 0.0% |
| PoznanHall2 | -0.5% | -0.2% | -0.1% | -0.1% | -0.2% |
| PoznanStreet | -0.1% | 0.1% | 0.0% | 0.0% | 0.0% |
| UndoDancer | 0.1% | -0.1% | 0.0% | 0.0% | -0.5% |
| 1024x768 | 0.0% | -0.1% | 0.0% | 0.0% | -0.1% |
| 1920x1088 | -0.1% | 0.0% | 0.0% | 0.0% | -0.2% |
| average | -0.07% | -0.04% | -0.02% | -0.02% | -0.12% |

Simulation results

■ Results

- Platform: HTM 6.0
- Test conditions: CTC with BVSP and Do-NBDV off

| | video 1 | video 2 | video PSNR / video bitrate | video PSNR / total bitrate | synth PSNR / total bitrate |
|----------------|---------------|---------------|-------------------------------|-------------------------------|-------------------------------|
| Balloons | 0.0% | -0.2% | -0.1% | -0.1% | 0.0% |
| Kendo | -0.2% | -0.1% | -0.1% | -0.1% | -0.1% |
| Newspapercc | -0.4% | -0.5% | -0.2% | -0.1% | -0.1% |
| GhostTownFly | 0.2% | 0.1% | 0.0% | 0.0% | 0.0% |
| PoznanHall2 | -0.4% | -0.4% | -0.1% | -0.1% | -0.2% |
| PoznanStreet | 0.2% | 0.1% | 0.0% | 0.0% | 0.0% |
| UndoDancer | 0.1% | 0.1% | 0.0% | 0.0% | 0.6% |
| 1024x768 | -0.2% | -0.3% | -0.1% | -0.1% | -0.1% |
| 1920x1088 | 0.0% | 0.0% | 0.0% | 0.0% | 0.1% |
| average | -0.08% | -0.14% | -0.05% | -0.04% | 0.04% |

- Thanks LG for the cross-check (JCT3V-D0171)

Thank you!