JCT3V-B0096:
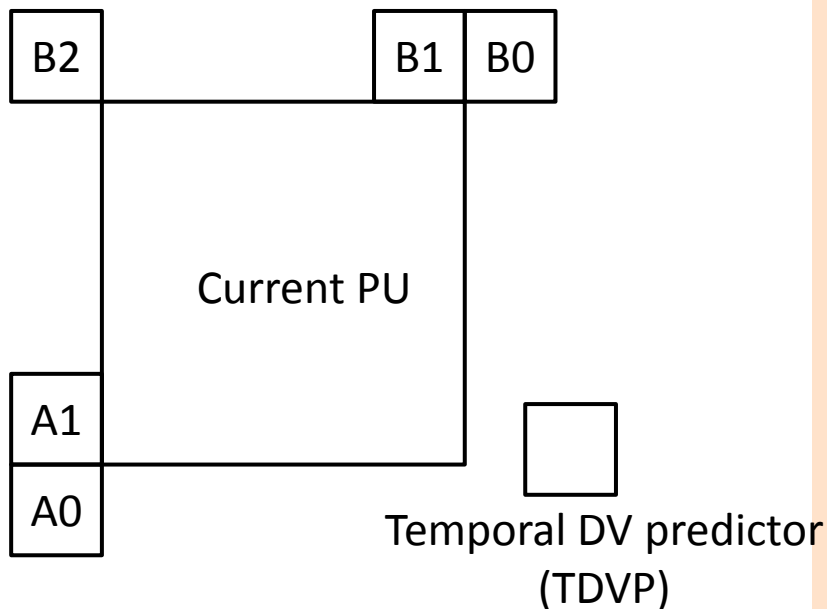Removal of dependency between multiple PUs in a CU for disparity vector derivation

Yongbing Lin, Jianhua Zheng

Xiaozhen Zheng
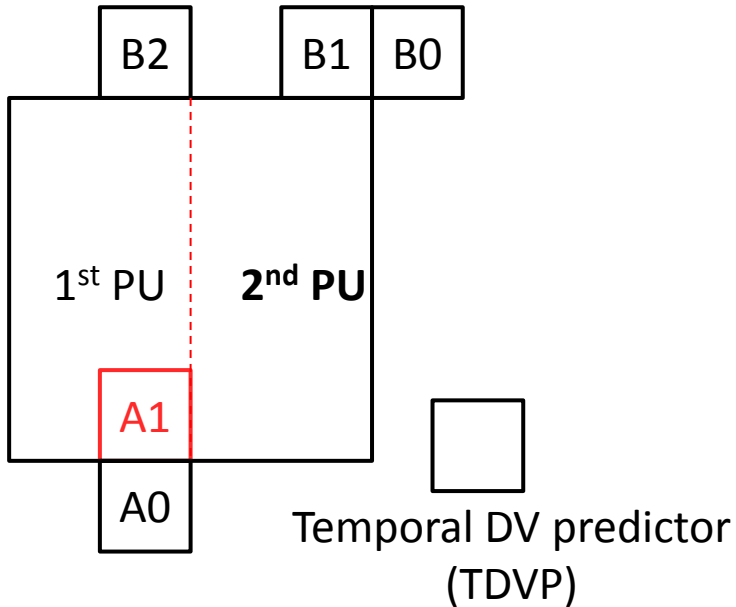
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Disparity vector derivation in HTM

B2   B1   B0

Current PU

A1

A0

Temporal DV predictor
(TDVP)

- **DV derivation process in HTM**
  - Deriving DV candidate from
  - **A1 -> B1 -> B0 -> A0 -> B2 -> TDVP**

- **Parallelism issue**
  - Dependency between multiple PUs in a CU, due to reference to neighbor blocks.
  - No allowing for parallel DV derivation in case of multiple PU in a CU

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Example: parallelism issue

B2   B1 B0

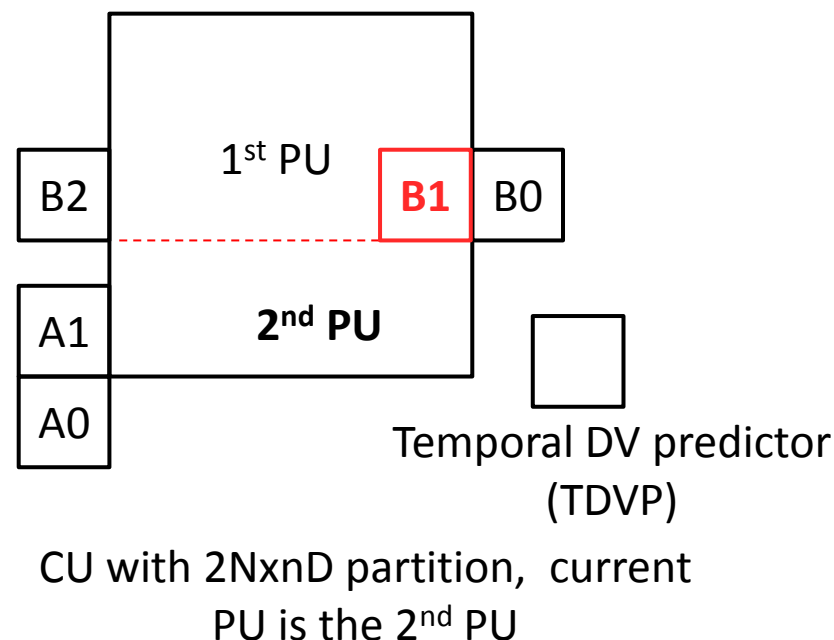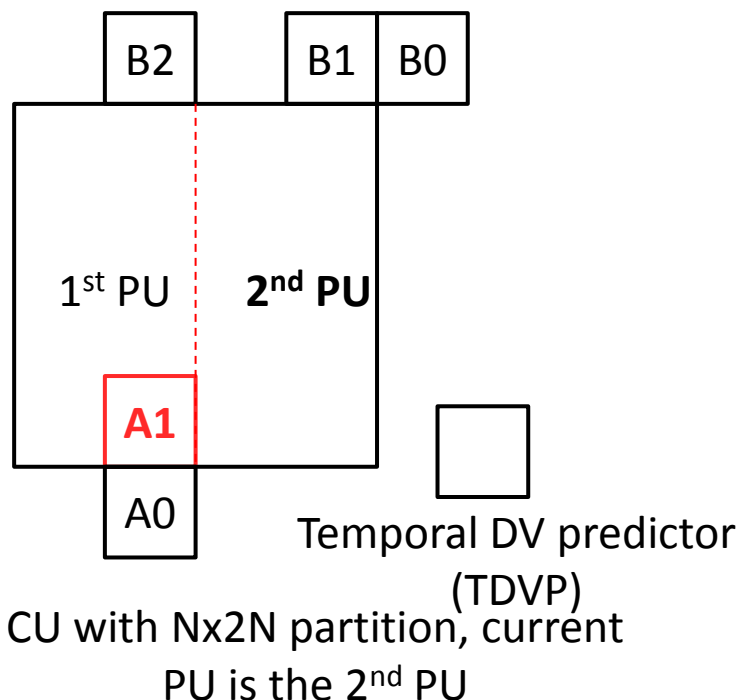1st PU   **2nd PU**

A1

A0

Temporal DV predictor
(TDVP)

Two PUs in a CU with Nx2N partition

- **During the DV derivation for 2nd PU**
  - A1 is located in the 1st PU
  - 2nd PU refers to the coded info of 1st PU
- **DV derivation process for the 1st and 2nd PUs can't be carried out in parallel**
- **Furthermore, no allowing of parallel merging candidate list construction for dependent view**
  - Because the derived DV is used to derive inter-view MVP candidate for merging list construction.

Proposed solution

- During the DV derivation for 2nd PU

  - A1 is skipped when current CU partition type is Nx2N, nLx2N, nRx2N

    ~~A1 ->~~ B1 -> B0 -> A0 -> B2 -> TDVP

  - B1 is skipped when current CU partition type is 2NxN, 2NxnU, 2NxnD

    A1 -> ~~B1 ->~~ B0 -> A0 -> B2 -> TDVP

CU with Nx2N partition, current PU is the 2nd PU

CU with 2NxnD partition, current PU is the 2nd PU

Experimental results

- Reference: 3D-HTM4.0.1, under common test conditions
- Cross-checked by LG in JCT3V-B0138

	video 0	video 1	video 2	video only	synthesized only	coded & synthesized	enc time	dec time	ren time
Balloons	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.8%	99.6%	99.8%
Kendo	0.0%	-0.2%	0.0%	0.0%	0.0%	0.0%	99.8%	101.6%	98.9%
Newspapercc	0.0%	-0.1%	0.0%	0.0%	0.0%	0.0%	99.4%	93.5%	99.1%
GhostTownFly	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%	100.4%	98.5%	99.1%
PoznanHall2	0.0%	0.3%	0.0%	0.1%	0.1%	0.1%	100.2%	102.0%	102.0%
PoznanStreet	0.0%	-0.3%	0.1%	0.0%	0.0%	0.0%	99.9%	99.5%	103.7%
UndoDancer	0.0%	-0.2%	-0.2%	-0.1%	-0.1%	-0.1%	100.0%	104.1%	102.8%
1024x768	0.0%	-0.1%	0.0%	0.0%	0.0%	0.0%	99.7%	98.2%	99.3%
1920x1088	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.1%	101.0%	101.9%
average	0.0%	−0.1%	0.0%	0.0%	0.0%	0.0%	99.9%	99.8%	100.8%

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Recommendation

- **The proposed method**
  - enables parallelism of DV derivation in case of multiple PUs in a CU.
  - furthermore, enables parallelism of merging candidate list construction for dependent view
  - no loss of coding efficiency
- **It is recommended to adopt the proposal**

Thank you!