# Fixing the number of mpm candidates

**JCTVC-F340**

Toru Kumakura, **Shigeru Fukushima,** Motoharu Ueda

JVC KENWOOD Holdings, Inc.

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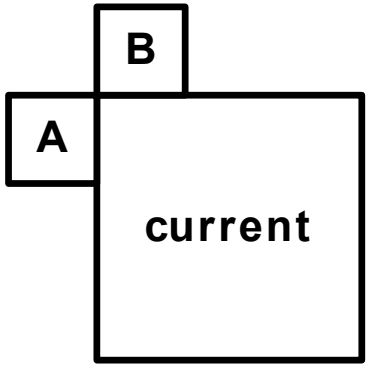
# 1. Overview

# Overview

- Proposed technique
  - Fixing the number of mpm candidates
- Algorithm
  - two mpm candidates always defined
  - Add Mode 17 for 4x4 PUs, and Mode 3 for 64x64 PUs
- Crosscheck
  - JCTVC-F350 by NEC
- Simulation results
  - Overall BD-rate no loss for IHE, 0.1% loss for ILC

# 2. Algorithm

# Fixing MPM candidates




Simplification of parsing process

- **Always set two MPM candidates**
- Pre-defined mode 2 or 0

| | Case | MPMCand0 | MPMCand1 |
|---|---|---|---|
| HM3.0 | modeA != modeB | min (modeA, modeB) | max(modeA, modeB) |
| | modeA == mode B | modeA | - |

| | Case | | MPMCand0 | MPMCand1 |
|---|---|---|---|---|
| proposed | modeA != modeB | | min (modeA, modeB) | max(modeA, modeB) |
| | modeA == mode B | modeA == DC | modeA (DC) | **0 (vertical mode)** |
| | | modeA != DC | modeA | **2 (DC)** |

# Add angular prediction mode for 4x4 and 64x64

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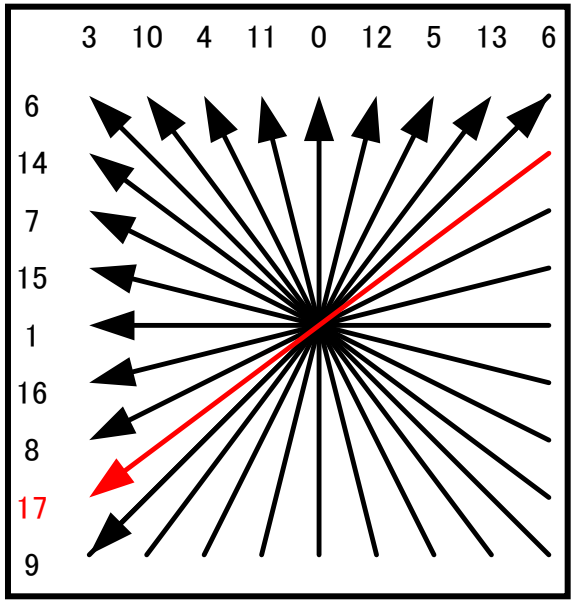
## The number of remainder always $2^N$

- **4x4 PUs**
  - Add mode 17
  - Fill a hole of angular prediction
- **64x64 PUs**
  - Add mode 3
  - Utilize useless bit




| PU size | numMode | numMPM | numRemainder |
|---|---|---|---|
| 4x4 | 17->18 | 2 | 16 |
| 8x8, 16x16, 32x32 | 34 | 2 | 32 |
| 64x64 | 3->4 | 2 | 2 |

# 3. Experiments

# Simulation results

- Overall BD-rate no loss for IHE, 0.1% loss for ILC

| | All Intra HE | | | All Intra LC | | |
|---|---|---|---|---|---|---|
| | Y | U | V | Y | U | V |
| Class A | 0.0 | 0.1 | 0.1 | 0.1 | 0.1 | 0.2 |
| Class B | 0.1 | 0.1 | 0.2 | 0.1 | 0.2 | 0.2 |
| Class C | 0.0 | 0.1 | 0.1 | 0.1 | 0.2 | 0.1 |
| Class D | -0.1 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 |
| Class E | 0.0 | 0.2 | 0.2 | 0.2 | 0.3 | 0.2 |
| **Overall** | **0.0** | **0.1** | **0.1** | **0.1** | **0.2** | **0.1** |
| Enc Time[%] | 101% | | | 102% | | |
| Dec Time[%] | 101% | | | 100% | | |

# 4. Conclusion

# Conclusion

- Suggestion
  - Fix the number of mpm candidates
    - Simplification of parsing process
    - Related contribution
      - JCTVC-F378 by Samsung
      - JCTVC-F459 by Qualcomm
  - Add mode 17 for 4x4 PUs
    - The number of remainder always $2^N$
    - Fill a hole of angular prediction

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