

JCTVC-F447

SIMD optimization of proposed HEVC core transforms

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Summary

- Stand-alone test program with inverse transforms
- Optimized SIMD implementation for Intel Sandy Bridge
- Full and partial transforms
- Combined with transform usage statistics from HM3.0
- Estimated CPU load from inverse transforms alone

Estimated cycle counts per 2D transform

| NxN | KxK | Column-row order | Row-column order |
|-------|-------|------------------|------------------|
| 8x8 | 8x8 | 167 | 152 |
| 8x8 | 4x4 | 108 | 78 |
| 16x16 | 16x16 | 943 | 859 |
| 16x16 | 8x8 | 547 | 467 |
| 16x16 | 4x4 | 304 | 233 |
| 32x32 | 32x32 | 5720 | 5322 |
| 32x32 | 16x16 | 2764 | 2442 |
| 32x32 | 8x8 | 1732 | 1405 |
| 32x32 | 4x4 | 1167 | 836 |

CPU load for Intel 3.5 GHz

| Sequence | Bitrate (kbps) | CPU load | Bitrate (kbps) | CPU load |
|-----------------|----------------|----------|----------------|----------|
| | QP=37 | | QP=22 | |
| Kimono | 560 | 0,6% | 5325 | 2,5% |
| ParkScene | 590 | 0,3% | 8221 | 1,1% |
| Cactus | 1308 | 0,8% | 19693 | 3,9% |
| BasketballDrive | 1572 | 1,2% | 20049 | 5,6% |
| BQTerrace | 799 | 0,4% | 50211 | 4,6% |