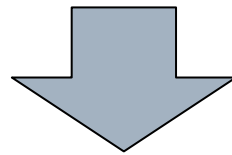


Background

- Diversification of digital video contents
 - Broadcasting (One-seg, MediaFLO)
 - Internet (Video sharing, On demand)



- Demand for ...
 - Multiple video displayed
 - Decoding of high resolution videos

However, these are difficult to realize due to constrained resources of mobile terminal

Objectives

Implement low computational cost video decoder by performance optimization and simplification of decoding process

Mobile phone, MID, Music player, Portable game console. . .



Targeted video coding

Videos for mobile terminals



- One-Seg, MediaFLO, Internet distribution



→ H.264 is common

- Employs high complexity coding tools
- Decoding cost is also high

High resolution videos



- HD broadcasting, Optical disk media



→ MPEG-2 is common

- Complexity is lower than that of H.264
- However, decoding cost is much higher than low resolution H.264 video

Performance optimization
Decoding process simplification

Optimization of H.264 decoder

- Utilizing SIMD extensions

 - Introduce optimized library of OpenMAX (API)

 - Entropy decoding, Inverse quantization, Inverse transform, Intra prediction, Motion compensation and Deblocking filter are replaced

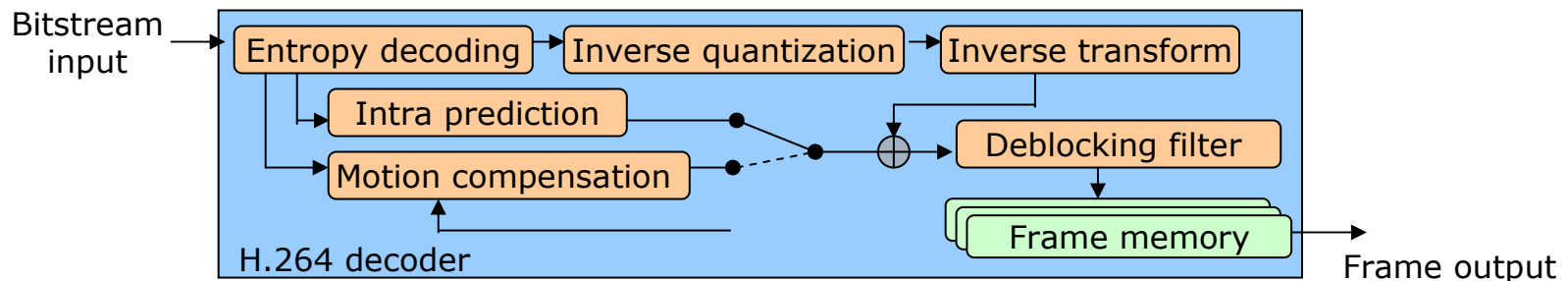
- Simplifying decoding process

 - (1) Deblocking filter skip

 - Skip the most costly function of H.264 decoding

 - (2) Simplified motion compensation

 - High cost 6 tap filter is replaced low cost bilinear filter



Optimization of MPEG-2 decoder

- Utilizing SIMD extensions
 - Motion compensation, Inverse discrete cosine transform and Variable length decoding are optimized
 - OpenMAX does not support MPEG-2
- Simplifying decoding process
 - Simplified DCT
 - Discard high frequency coefficients
 - Normal : 8x8
 - Simplified : 4x4
 - VLD skip
 - Multi-symbol VLD of unnecessary coefficients
 - Using a special reference table

4x4 IDCT →

64	3	3	0	0	0	0	0
2	1	0	1	0	0	0	0
0	2	0	0	1	0	0	0
1	0	0	0	0	0	0	0
0	0	0	1	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0