研究背景

Every day we live in a video’s world!

1. Demand for high resolution video quality
2. Limited network bandwidth and storage capacity
3. Demand for portable application

Low Complexity Digital Video Compression

Target:
Reduce the complexity for H.264 with no significant video quality loss

研究内容

Our Proposed Solution for Video Encoder

Proposed Low Complexity Fast Motion Estimation Search

Major problems
High complexity, Significant video quality loss, Bad detection accuracy, Bad detection efficiency

Solutions
Adaptive encoding parameter adjustment, Cross-Diamond search pattern, RDO based skip mode early detection, All-Zero Block early detection

Evaluation results
Encoding time, Video quality, Detection accuracy, Detection efficiency

Computation reduction from 35% to 75% with negligible video quality loss. (Compared with UMHS)

Proposed Low Complexity Application Specific Instruction-Set Processors

Major problems
Flexibility, Efficiency, Power

Solutions
Fast ME Algorithm, ASIP Platform, Edge and SAD Calculation Instruction, SIMD

Evaluation results
Instruction amount, Clock, and so on

Save 95% instruction, estimated 48% clock cycle reduction for ME processor. (Compared with GPP)

Research Method:
A. Mathematical derivation method
B. Statistical analysis method

主な発表論文

