H.264 BASELINE PROFILE SOFTWARE ENCODER

OVERVIEW

The AL-H264E-SW Video Encoder is H.264 Baseline Profile implementation for Mobile Platforms. The software IP is optimized with innovative and efficient algorithms that Atria Logic has developed for low-power and high efficiency mobile applications. The implementation is highly efficient in terms of speed and memory footprint. The IP creates high quality streams at low bit-rates.

Designed for easy reuse and optimization, the Software IP runs on several platforms and operating systems. The design has been proven on Tilera TilePro64, ARM7, ARM9, ARM9E and ARM11. The design has been tested in both Windows and Linux environments.

The design can encode Baseline profile up to level 3. The design can handle very low bitrates in both variable and constant modes. The design can encode up to 1080pHD resolution videos. The various unique qualities of this particular design consist of support of all block sizes as specified by the standard for inter and intra prediction, support of half and quarter pel prediction in motion estimation, supports unconstrained intra prediction mode and motion estimation over frame boundaries mode, in-loop deblocking filter is implemented. The rate control algorithm is proprietary which changes the Qp values in a single pass. The mode decision for best prediction is done using rate-distortion algorithm for good PSNR values.

APPLICATIONS

- Mobile phone, Handheld video
- Camera, Security systems
- Video game consoles, Mobile TV
- Blu-ray DVD players
- Satellite TV/IPTV/Cable Set-top-box
- Video conferencing
- HD enabled MID, netbook

Features

- ✓ Compliant with ITU-T Recommendation H.264 ISO/IEC 14496-10 Advanced Video Coding Standard at Baseline profile up to Level 3.1.
- ✓ Proprietary motion estimation algorithm that has been optimized for speed.
- ✓ Inter prediction supports all the block sizes up to 4x4 and supports half pel and quarter pel resolution.
- ✓ Intra prediction supports all 4x4, all 16x16 and all chroma prediction modes.
- ✓ Supports all frame rates and bitrates (both constant and variable) compliant with the standard.
- ✓ Input format is progressive YUV 4:2:0 and the output is H.264 compliant bitstream/NALU.
- ✓ Supports I and P picture types.
- ✓ Proprietary rate control algorithm and R-D optimized mode decisions for best quality at a given bitrate.
- ✓ Proven on Tilera TilePro64, ARM7, ARM9, ARM9E and ARM11 platforms using chip specific intrinsics.
- ✓ Proven on Microsoft Windows and Linux flavors of OS.

PERFORMANCE

The implementation shows excellent results on all platforms. The benchmarking results are shown in table below for “Moderate Quality” mode encoder on ARM9 Simulator:

Frame Size	Sequence Name	No. of Frames	MCycles/sec[#] on ARM9[*]	Coding tools enabled in benchmarking streams
QCIF	Akiyo	300	52	Intra Modes: 16x16, 4x4 Reference Frame: 1 MC Block: Up to 8x8 MV Resolution: Qpel In-loop Deblocking: ON Entropy coding: CAVLC FMO/ASO: OFF Bit-rate: 64kbps
	Foreman	300	95	
	News	300	63	
	Table	300	76	

DELIVERABLES

- C source code or object file optimized and compiled for a specific platform.
- Makefile with user configurability extension file to change the configuration of the encoder.
- Comprehensive user documentation, including detailed specifications and a system integration guide.

ORDERING INFORMATION

Please contact the following office for evaluation and licensing questions.

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