



Digital Signal Processor Video Codec Software

H.264/SVC SBP Encoder Software Module

Supports StarCore SC3850-based DSPs (MSC815x and MSC825x)

Overview*

The H.264/SVC encoder software module for the MSC815x and MSC825x multicore DSP families implements the Scalable Baseline Profile of the H.264 standard.

The objective of the SVC standardization is to help enable the encoding of a high-quality video bitstream that contains one or more subset bitstreams that can themselves be decoded with a complexity and reconstruction quality similar to that achieved using the existing H.264/AVC design with the same quantity of data as in the subset bitstream. The subset bitstream is derived by dropping packets from the larger bitstream.

A subset bitstream can represent a lower spatial or temporal resolution or a lower quality video signal (each separately or in combination) compared to the bitstream it is derived from. The following modalities are possible:

- Temporal (frame rate) scalability: the motion compensation dependencies are structured so that complete pictures (i.e. their associated packets) can be dropped from the bitstream. Temporal scalability is already enabled by H.264/MPEG-4 AVC. SVC has only provided supplemental enhancement information to improve its usage.

- Spatial (picture size) scalability: video is coded at multiple spatial resolutions. The data and decoded samples of lower resolutions can be used to predict data or samples of higher resolutions in order to reduce the bit rate to code the higher resolutions.
- SNR/quality/fidelity scalability: video is coded at a single spatial resolution but at different qualities. The data and decoded samples of lower qualities can be used to predict data or samples of higher qualities in order to reduce the required bit rate to code the higher qualities.
- Combined scalability: a combination of the three scalability modalities described.

* Adapted from http://en.wikipedia.org/wiki/Scalable_Video_Coding, under the terms of CC BY-SA.

Key Features

- H.264/SVC scalable baseline profile
- Full-HD support
- YUV 4:2:0 non-interleaved input
- I, P, EI and EP slices
- Progressive frame coding
- Up to five temporal layers with dyadic structure
- Up to three spatial layers with spatial ratio of x1.5 or x2
- Up to three quality layers per spatial layer
- All Intra 4 x 4 and Intra 16 x 16 prediction modes and intra base mode prediction between spatial layers
- Block partitioning modes: 16 x 16, 16 x 8, 8 x 16
- ½ and ¼ pixel interpolation
- Base mode prediction, motion vector prediction and residual prediction
- CAVLC entropy coding
- CABAC entropy coding for EI and EP slices
- Loop filter and inter-layer loop filter between spatial layers
- Scene-cut detection
- CBR rate-control supporting up to three quality layers, three spatial layers and three temporal layers*
- NAL and RTP output stream
- Option to limit NALU size to accommodate network MTU
- Complies with Freescale's SmartDSP API with video extensions
- Designed for multicore operation
- Validated on MSC8156ADS
- Supports a full scalable 1080p at 30 fps encoded stream on a single MSC8256 DSP

* Not all features may be available in the evaluation package

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