Montium® DAB/DAB+ Viterbi Decoder

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Highlights

- Fully DAB/DAB+ compliant.
- Reconfigurable rate.
- Reconfigurable decision depth.
- 1 Viterbi butterfly per cycle.
- Parameterizable depuncturing unit (UEP/EEP).
- Up to 2.1 Mbps data throughput (@ 100MHz).
- Ultra fast configuration time (typically 6 μs).
- Low power consumption.

Overview

The Montium® DAB Viterbi decoder is a soft IP core implementation of the Viterbi algorithm on a Montium hardware IP core that finds many uses in professional digital audio / video applications, such as DAB, DRM and DVB. Implemented in MontiumC, the basic task for the Montium Viterbi decoder is to estimate the path that an encoder took through the “Trellis” using statistical signal processing techniques, such that any corrupt data bits may be corrected.

Rate / Puncturing

The Montium DAB Viterbi decoder implementation has a fixed constraint length (k = 7) with rate, R = 1/4. The implementation incorporates a depuncturing process that is fully compliant with the DAB puncturing procedure. By virtue of the depuncturing process, Recore’s Montium DAB Viterbi decoder is able to decode UEP as well as EEP DAB signal streams.

Decision depth

The decision length of the reconfigurable Viterbi decoder is commonly referred to as “traceback length”. The decision depth is configurable, and thus may be set to any appropriate number depending upon the level of puncturing required and the quality of the channel (e.g., SNR). The maximum decision depth is only limited by the memory capacity of the target Montium tile processor.

Reusability

Due to the flexibility of the Montium tile processor, the DAB/DAB+ Viterbi decoder can be easily replaced or augmented for other applications.

Applications

- Digital radio applications (DAB/DAB+)
- Digital media broadcasting (DMB)

Montium hardware IP core

Recore’s Montium is a dynamically reconfigurable hardware IP core for computation intensive DSP algorithms. The Montium is typically used in (heterogeneous) multi-core systems. High performance coupled with excellent power efficiency is achieved by virtue of the Montium tile processor’s unique coarse-grained reconfigurable architecture.

Sensation Suite IDE

Based on the industry standard Eclipse platform, the Sensation Suite is an integrated development environment (IDE) for Montium based platforms. This comprehensive IDE is an all-in-one compiler, simulator, debugger and editor, which may be used to expedite algorithm development with the Montium DAB Viterbi decoder soft IP core on a Montium hardware IP core. The IDE is also fully compatible with the Montium hardware development board, hence reducing time to market.

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