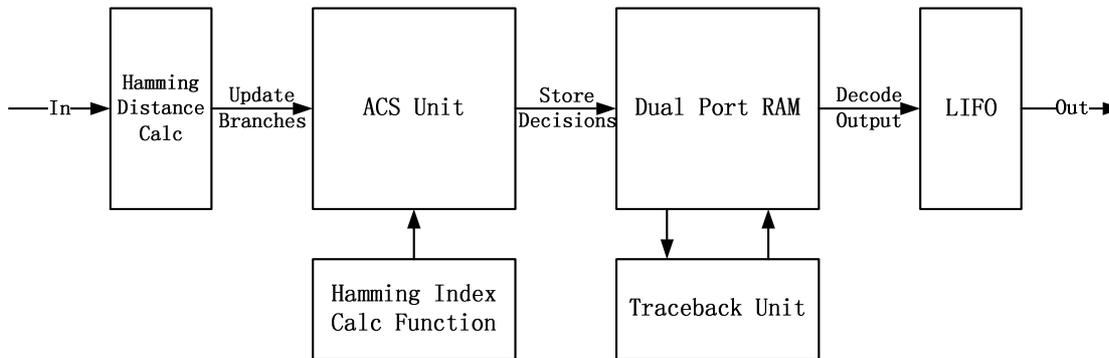


# STRUCTURE OF VITERBI DECODER

## GRAPHICAL REPRESENTATION

The structure of a high speed viterbi decoder is shown in following figure:



## DESCRIPTION

A viterbi decoder decodes a bit stream of convolutional code using Viterbi Algorithm. The commonly used structure of a high speed viterbi decoder includes following modules:

### *HAMMING DISTANCE CALCULATION*

The Hamming Distance is calculated by addition of the input signals.

### *ACS UNIT*

The ACS (Add, Compare and Select) Unit is the core of the decoder. It performs update of branch metrics, Compare candidates, select the shorter ones and output the decision(s) to RAM. For most occasions, the unit is the limit of the throughput rate.

### *HAMMING INDEX CALCULATION FUNCTION*

This unit returns the hamming index for each branch in the ACS Unit.

### *RAM*

This part stores all the decision index of the ACS Unit which is also the path set that contains the ML path. A dual port RAM is needed for synchronized write process and asynchronized read operation.

### *TRACEBACK UNIT*

Traceback Unit cooperates with RAM to find the initial state of the decode sequence.

### *LIFO*

Since the decode sequence is reverse, a LIFO is required.