Chapter 4

Conclusions

The MLSDA proposed by Han and Chen is a sequential type decoding algorithm. Since this decoding algorithm uses two stacks to manage the nodes expanded during the decoding process, we need to find a way to resolve the sorting in stacks in order to implement this decoding algorithm. The traditional method to model a stack memory is using a RAM and the sorting time is not a constant duration. In order to solve the drawback, we refer to the priority queue algorithms (PESPQ and MISPQ) and modify them to implement MLSDA. Although the priority queue module is more complex than the stack memory, it can deliver the node with the best metric in a constant duration.

In the thesis, we also proposed a new viewpoint for sequential decoding. We converted the 1/2 code into its corresponding 2/4 (3/6) code, and the decoding steps are fewer for the 2/4 (3/6) code. Although the complexity (the number of gates) of decoder is higher for 2/4 (3/6) than that for 1/2 code, one may make a tradeoff between gates and the decoding speed.

Since MLSDA is a maximum-likelihood decoding algorithm, one may use the trace back length using for Viterbi decoder. For example, 60-100 is enough for the (2,1,6) code simulated in this thesis. Consequently, the decoding delay time will be shortening.