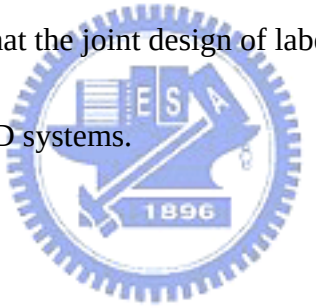
Chapter 7

Conclusions and future works

7.1 Conclusions

In this thesis, we first introduce the BICM-ID system. Then we derive the calculations of the inner detector and the BCJR algorithm. EXIT chart analysis is also mentioned in chapter 4. We propose some labeling designs with EXIT chart in BICM-ID systems and show that the joint design of labeling and outer codes will have better performance in BICM-ID systems.

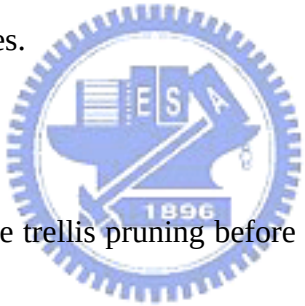


Next, in order to meet the various requirements of the system, we made some changes to the coding schemes. First, we introduce trellis-pruned convolutional codes in the BICM-ID systems. We show that determinate bits play an important roles to improve the performance although the code rate will be lowered. Secondly, the punctured convolutional codes are described. It can increase the transmission rate but suffers some performance loss.

7.2 Future works

Labeling is the very crucial parameter in the BICM-ID systems. In this thesis we provide an guideline, average bit differences, to design the labelings by changing the slopes of the transfer curves. Next, we can do more on the labeling design.

1. Build a labeling table with ten or more labelings with different transfer curve slopes.
2. Using another way to calculate the bit metrics to get different shapes of the detector transfer curves.



Besides, if we first use trellis pruning before encoding and then puncture the coded bits after encoding, will the performance be improved or lowered? Or how can we make it perform better? All thesis things are interesting and have potential.