INTEGER CODES CAPABLE OF CORRECTING BURST TYPES OF ERRORS WITH ERRONEOUS DECODING PROBABILITY

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Conclusion and Future Work

- In Chapter 2, we have presented a class of integer codes capable of correcting asymmetric CT-bursts constructed with the help of computer search results. The probability of erroneous decoding over a Z-channel and the ratio for an error to go undetected are discussed. Similar encoding and decoding can be tried for CT-bursts occurring across two adjoining b-bit bytes, which can work without interleaving.
- In Chapter 3, we have presented two classes of integer codes capable of correcting low-density and high-density asymmetric CT-bursts within a b-bit byte using weight constraint, also a probabilistic approach has been developed for such errors. Compared to similar codes, the proposed ones require less memory, use a smaller number of table look ups, and have a better code rate. This work can be further carried out for such CT-bursts which are spread over adjacent b-bit bytes. We can also look for similar works on moderate-density CT-bursts.
- In Chapter 4, we have presented a class of integer codes capable of correcting unidirectional solid bursts occurring within a b-bit byte. Also, it is compared with some similar error-correcting codes and found suitable in many ways. We discovered that the probability and BER of these codes decrease as the code rate increases. Similar error-correcting procedures can be analysed for symmetric channels having different crossover probabilities for $1 \rightarrow 0$ and $0 \rightarrow 1$.
- In Chapter 5, we have constructed a class of integer codes capable of correcting asymmetric solid bursts occurring within a b-bit byte as well as between two adjoining b-bit bytes. Extending the error-correcting capability of integer codes to adjoining b-bit bytes makes this class suitable for implementation in communication channels having multiple bit units. Since the existence of this class depends on computer search results, so to determine a necessary and sufficient condition mathematically for the existence can be considered as a further course of action.
- In Chapter 6, we have presented a class of integer codes capable of correcting asymmetric burst errors. We have shown that the presented codes are very efficient in terms of redundancy. More precisely, it has been shown that they are more rate-efficient not only than their linear counterparts, but also than the optimal burst error correcting codes. In addition, the proposed codes use operations that are supported by all processors, which makes them attractive for use in systems that display asymmetric errors. The best-known examples of such systems are optical networks and VLSI memories.

- In Chapter 7, we have derived the probability of erroneous decoding for integer codes having symmetric and asymmetric natures of errors. This simplifies the process of analysing the codes to carry out research in different aspects of statistics used in coding theory. By replicating the approaches developed above, we can obtain the probabilities for any type of error in integer codes having symmetric and asymmetric patterns. By using similar approach, probability can also be determined for binary communication channels having different probabilities for $1 \to 0$ and $0 \to 1$.