7.1 Conclusion

In this work, modified decoding algorithms for Euclidean Geometric codes for memory applications have been proposed. By using the properties of the codes, the proposed schemes ensure that uncorrectable errors that exceed the error correction capability of the code by one bit error are always detected. Also, by using additional logic for error detection, the probability of detecting errors that affect more bits is also substantially improved. This is useful to avoid silent data corruption that can cause catastrophic failures in critical systems. By combining with previously existing techniques, the modified algorithms can be implemented very efficiently in terms of the number of gates required and with a low latency. This makes them attractive for memory applications. The proposed scheme can be extended by requiring a larger number of the majority logic check equations to take a value of one to perform a correction. This would increase the error detection capabilities at the expense of the error-correction capabilities. This work developed an approach for fault tolerance in memory system. A proportionate fault tolerance system is defined for encoder fault. Fault corrector logic for multiple faults is developed. A geometrical coding approach generated by the combination of multiple tap sequence. A self repairing logic for permanent fault in memory location is developed. A line switch coding is developed to achieve the total fault tolerance in interlink side. The developed approach is evaluated for different functional descriptions and is synthesized over Xilinx FPGA device for real time evaluation.
7.2 Future Scope

The coding approach developed can be extended to multi-system fault diagnosis. The proposed approach is robust to soft faults at storage unit; however the work can also be extended in online system.