Abstract

Triple Modular Redundancy (TMR) is usually used to increase safety and the reliability of safety-critical systems where three identical segments are used in identical and the ultimate outcome is reached using voting techniques. Fault masking is one of the main techniques to improve the normal actions of a range of safety-critical techniques. Some commercial areas which implement such techniques include process control, transport, and atomic power place and army programs. Integrated Voter for majority and weighted-average used to provide for a fault masking capability in safety-critical systems [1]. The Majority voting gives a high level of safety and the weighted-average offers a good level of availability. If integrated these two gives a good level of safety in Majority voting not in integrated voting. Here propose a new voting algorithm for faulty masking taking the disadvantage of previous algorithm. In this Incorporating Majority voting and score based fuzzy voting schemes. Safety performance is evaluated by running proposed, Majority and score based fuzzy voting on a triple modular redundant (TMR) system for 10000 voting cycles in various error scenarios. Experimental results show that proposed fuzzy Voter is given a higher safety than other two voting algorithms.

References

- EUROCAE/RTCA, "ED-12B/DO-178B: Software Considerations in Airborne Systems and Equipment Certification", EUROCAE/RTCA, 1994

Index Terms

Computer Science  Fuzzy Systems
Keywords

Fuzzy Voters  Safety-Critical Systems  Triple Modular Redundant (TMR)  Fault Tolerance

Fault masking.