

**RELIABILITY OPTIMIZATION USING HARDWARE REDUNDANCY: A *PARALLEL*  
*BB-BC* BASED APPROACH**

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**ABSTRACT**

Reliability optimization using hardware redundancy or reliability redundancy allocation problem (RRAP) is a complex, NP hard problem. This paper proposes a parallel big bang big crunch based approach to reliability optimization using hardware redundancy or RRAP. The approach was implemented in MATLAB and is validated using two examples. One of the examples is a 14 dimension well known problem from the literature. The results are compared from the seven other algorithms namely C Programming Language Simplex optimization software (CPLEX), Genetic Algorithm (GA), Ant Colony Optimization (ACO), Immune Algorithm (IA), Tabu Search (TS), Hybrid Parallel Genetic Algorithm (HPGA) and Big Bang Big Crunch (BB-BC) approach. It is observed that the proposed method has a very fast converging rate as compared to BB-BC and has better accuracy as compared to all the approaches. The results clearly indicate that the proposed approach out performs all other seven approaches.

**KEYWORDS:** Reliability Optimization Using Hardware Redundancy