

MCERTL: Mutation-Based Correction Engine for Register-Transfer Level Designs

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Abstract : In this paper, we present MCERTL (mutation-based correction engine for RTL designs) as an automatic error correction technique based on mutation analysis. A mutation-based correction methodology is proposed to automatically fix the erroneous RTL designs. The proposed strategy combines the processes of mutation and assertion-based localization. The erroneous statements are mutated to produce possible fixes for the failed RTL code. A concurrent mutation engine is proposed to mitigate the computational cost of running sequential mutants operators. The proposed methodology is evaluated against some benchmarks. The experimental results demonstrate that our proposed method enables us to automatically locate and correct multiple bugs at reasonable time.

Keywords : bug localization, error correction, mutation, mutants

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