

عنوان مقاله:

FPA-Debug: effective statistical fault localization considering fault-proneness analysis

محل انتشار:

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خلاصه مقاله:

The aim is to identify faulty predicates which have strong effect on program failure. Statistical debugging techniques are amongst best methods for pinpointing defects within the program source code. However, they have some drawbacks. They require a large number of executions to identify faults, they might be adversely affected by coincidental correctness, and they do not take into consideration fault-proneness associated with different parts of the program code while constructing behavioral models. Additionally, they do not consider the simultaneous impact of predicates on program termination status. To deal with mentioned problems, a new 'fault-proneness'-aware approach based on elastic net regression, namely FPA-Debug has been proposed in this paper. FPA-Debug employs a clustering-based strategy to alleviate coincidental correctness in fault localization and finds the smallest effective subset of program predicates known as bug predictors. Moreover, the approach considers fault-proneness of code during statistical modelling through applying different regularization parameter to each program predicates depending on its location within program source code. The experimental results on well-known test suite, Siemens, reveal the effectiveness and accuracy of the FPA-Debug.

کلمات کلیدی:

fault localization; fault-proneness; elastic-net regression; coincidental correctness

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