

CTJ: Input-Output Based Relation Combinatorial Testing Strategy Using Jaya Algorithm

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Abstract:

Software testing is a vital part of the software development life cycle. Most of the time, the system under test has more than one input and testing of every combination of inputs is almost impossible as the time of execution of the test case is outrageously long. Combinatorial testing is the way to encounter exhaustive testing through the testing of every input values and every combination between parameters. Combinatorial testing can be divided into three types which are uniform strength interaction, variable strength interaction and input-output based relation (IOR). IOR combinatorial testing only tests for the important combinations selected by the tester. Most of the researches in combinatorial testing applied the uniform and the variable interaction strength, however, there is a leak addressing IOR. In this paper, a Jaya algorithm is proposed as an optimization algorithm engine to construct a test list based on IOR in the proposed combinatorial test list generator strategy and named as (CTJ). The result of applying the Jaya algorithm in input-output based combinatorial testing is acceptable since it produces a nearly optimum number of test cases in a satisfactory time range.

Keywords: Jaya algorithm; Software testing; Combinatorial testing; T-way testing; System reliability

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