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VARIABLE STRENGTH COMBINATORIAL TEST DATA GENERATION USING ENHANCED BIRD SWARM ALGORITHM

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ABSTRACT: Combinatorial analyzing is a productive black box-checking approach for the machine with numerous quantities of boundaries and their qualities. Be that as it may, for fundamentally blended and key component, combinatorial evaluating still claims high intricacy. Testing totally the middle a piece of those components for the most part is a type of arrangement and Variable strength combinatorial test information age (VS-CTDG) arises. In this assignment, improved feathered creature swarm calculation (EBSA), a form of fowl Swarm calculation (BSA), is employed into the issue besides, a looking at prerequisite decrease is proposed and makes EBSA extra suitable into VS-CTDG than at any other time. Through benchmarks, EBSA is demonstrated a successful strategy.

Keywords: VS-CTDG, EBSA, BSA, Swarm.

I. INTRODUCTION

Software testing is associate degree approach that verifies the consistent between customers expect and code physical object and evaluates the inner correctness of software package. recorder testing that's inclined to code outer feature and white box testing that accustomed judge software inner correctness are presently 2 thought technologies within the fields of software testing. Combinatorial checking may be a reasonably recorder testing that uses sampling mechanism to extract partial test cases from complete test suites to sight code failures caused by parameters and their interactions from System underneath check (SUT). The idea of combinatorial testing is that system. Combinatorial testing knowledge generation that constructs optimum covering array may be an analysis stew in combinatorial testing. Though effectively reducing the amount of check cases, combinatorial testing usually encounters downside on combination explosion, the big variety of combination of parameters and their price, once applied into real industry's software. In most situations, t-way combinatorial testing is effective and promising. But some key elements bestowed systems want be tested higher strength that is additionally known as VS-CTDG.

Combinatorial testing is an efficient recorder testing technique for the system with massive numbers of parameters and their values. Combinatorial checking could be a reasonably recorder testing that uses sampling mechanism to extract partial test cases from complete test suites to sight package failures caused by parameters and their interactions from system beneath test. Combinatorial testing data generation is interested in how to generate the optimal covering array, which not only covers t-

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way parameter combinations, but also owns minimum coverage number, number of test case in optimal covering array. Therefore, these existing strategies often generate approximate optimal covering array for system under test (SUT) with multiple parameters with large value domain.

II. RELATED WORK

Combinatorial Testing (CT) can sense failures caused by connections of limits in the Software under Test (SUT) with a covering array test suite generated by some sample tools. To ensure successful testing, system should apply CT wisely. This requires professional skill and good judgment in its application. The full strengths and weaknesses of CT need to be better understood. In this system, survey the state of the research of CT. In this, have collected over 90 key papers related to CT. We classify these into eight categories [9]. (1) Modeling (Model): Studies on finding the limits, values, and the inter-dealings of limits of SUT. (2) Test case generation (Gen): Works on processing a tiny test suite efficiently (3) Constraints (Constr.): Works on circumvent un-well test cases in test suite generation. (4) Failure characterization and diagnosis (Fault): Studies on fixing the detected faults. (5) Betterment of testing methods and the application of CT (App.): Works on experiments testing method for CT and generating the results of the CT application. (6) Arranging of test cases (Prior.): Works on series of test implementation to get faults as early as possible in the most low-cost way. (7) Metric (Metric): Studies on computing the mixture reporting of CT and the efficiency of error discovery. (8) Evaluation (Eval.): Studies on the unit to which CT adds to the perfection of software quality [8].

III. Methodology

The System is based on Bird Swarm Algorithm [5]. Bird swarm algorithm (BSA) is a kind of swarm intelligent evolutionary algorithm, which simulates the foraging behavior of bird swarm in nature to solve optimization problems. It employs a group of birds as a candidate solution set, and each bird represents a position in the solution space. Updating the position is used to search the optimal solution through one of the three behaviors: foraging behavior, vigilance behavior and flight behavior. After that, there is a fitness function to estimate bird quality. When the algorithm is initialized, all birds are randomly distributed throughout the solution space. Each bird in bird swarm flies in the solution space according to one of the three behaviors, and gradually converges to the approximate or optimal solution of the problem. Assuming that the solution space of problem is a dimension real number space, each bird represents a position in the solution space, Note that BSA is originally used for optimization problems of real number space, but combinatorial test data generation is a discrete combinatorial optimization problem that each dimension of bird's position is an integer. Therefore, when updating the position of birds, the algorithm needs make round operations on computing results.

Problem is being solved using the Enhanced Bird Swarm Algorithm over Bird Swarm Algorithm for the combinatorial testing. Moreover a testing requirement reduction is proposed and makes EBSA more suitable into VS-CTDG than ever.

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PROPOSED METHODOLOGY

Enhanced bird swarm algorithm (EBSA), a variant of Bird Swarm algorithm (BSA), is utilized into the matter. Moreover, a testing demand reduction is projected and makes EBSA a lot of appropriate into VS-CTDG (check information Generation) than ever. Combinatorial strategy roughly is classified into 2 categories containing algebraically technique and computing approach, which incorporates one-test-at-a-time (OTAT), input parameter order (IPO), and search-based approach. The project in the main introduces search-based approach that's typically integrated with OTAT framework. The OTAT generates a test suit at a time consistent with greedy strategy to hide uncovered tuples as a lot of as doable till uncovered t-tuples are lined. Its input is System below check (SUT) and combinatorial strength and its output is covering array (CA).

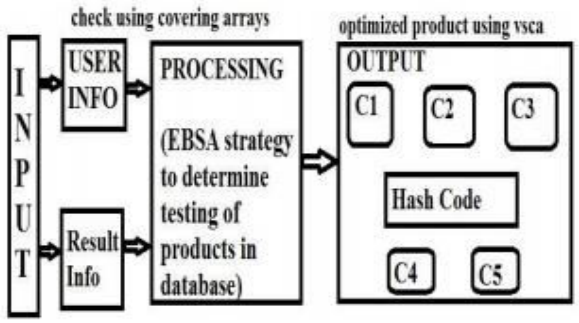

Figure 1: Architecture

The Input is being given as the user's info and the product info. Before processing it is check using covering array. EBSA strategy determines testing of products in database. Later the hash codes are produced. The system has five components namely Web Server with 2 configurations, Smart Phone with 2 configurations, Payment Server with 2, Database with 3, and Brower with 3.Here components are viewed as factors and configurations as levels.

Advantages: It is simple to use. Variable strength combinatorial testing is more. Realistic technique. A new method called EBSA for adaptable forte. Combinatorial test data generation has been presented. EBSA, an improved version of BSA, has been evaluated. In this EBSA is an effective approach, especially in VSCA containing MCA.

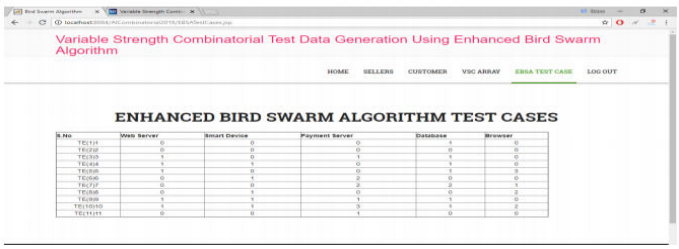

Figure 2: EBSA Test Case Result

CONCLUSION

We have tried to implement the Author "Lizhi cai, Yang Zhang and Weijia ji" of paper "Variable Strength Combinatorial Test Data Generation Using Enhanced Bird Swarm Algorithm" IEEE 2018.Variable strength combinatorial testing is a more realistic technique that uniform strength combinatorial testing. EBSA, and better variety of BSA, has been evaluated through benchmarks. Experimental results indicate EBSA is an effective approach, especially in VSCA containing MCA.

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