PRODUCT BACKGROUND

A common problem in IoT systems is the large number of the combinations of hardware, operational, and software configurations that need to be tested. Due to the limitations of time and cost, there is a need for testing reduction but with sufficient testing. Therefore, in this project a new combinatorial testing strategy based on Harmony Search Algorithm called Harmony Search Strategy (HSS) has been developed. Empirical results obtained by HSS compared with the existing combinatorial testing strategies.

NOVELTY & INVENTIVENESS

- Summary of novel features
- Support constraint for test data reduction
- The first IoT combinatorial testing strategy used meta-heuristic technique to minimize the test list.
- Sustainability practices & contributions
- Improves software testing practices with lesser test size, hence reduces testing costs
- More effective at finding software faults.
- Result of comparing with existing strategies

KEY FEATURES

- Generates Optimized set of test cases for automated or manual testing
- Applies requirements / business rules to the test data
- Exports tests to Excel for input into automated testing tools such as Quick Test Professional.
- Organizes your tests and requirements as Enterprises, Projects, and Roles

KEY BENEFITS

- Significantly reduces the number of test combinations
- Supports well-defined or poorly defined requirements
- Easily adaptable to changing software requirements
- Dramatically increases QA testing quality and productivity
- Save thousands of dollars in test case development costs
- Applicable to all types of testing including GUI, Performance, System configuration, Interoperability, Function, and unit testing
- Months worth of testing can be done in just weeks and will be accurate
- Extremely easy to use - generate test cases in minutes

APPLICABILITY

- Normally a software product contains more than this number of features, if the product contains 20 features, the total test case generated will be 2^20 which is 1048576 and it takes 5242880 minutes (around 87381 hours = 9.98 YEARS) to test the combinations exhaustively.

By using IoTCT tool will produce the similar accuracy in 10 test cases with 10 minutes

PATENTS / ACHIEVEMENTS

- Three copyrights produced
- Two chapters

- This tool is already in use to facilitate practical learning of two software testing courses – BCS3282 (Software Quality Assurance) and BCS3323 (Software Testing and Maintenance) at undergraduate level. E-PAT (Students Lab evaluation) gives promising results

AWARDS/GRANTS

Best Paper Award in (SOFTIC 2012)
Best Paper Award in (MUCET 2014)

COMMERCIALIZATION POTENTIAL

- This strategy (tool) can be sold by RM6000/copy, while the HEXAWIXE web based tool cost $1,995/month for company less than 500 license.
- Also, this strategy can be sold by RM6000/year

COLLABORATION

- IT Dep. At KEE SONG Brothers Poultry Industries Pte Ltd (Singapore)
- Compliment LETTER from Malaysia Software Testing Board.
- Jazan University and King Khalid University (Saudi Arabia)
- IBM centre UMP

![IoTCT: IoT Combinatorial Testing Tool](image)

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