A Random search based effective algorithm for pairwise test data generation

S. Khatun[a]; K. F. Rabbi[a]; C. Y. Yaakub[a]; M. F. J Klaib[b]
[a]Faculty of Computer Systems & Software Engineering University Malaysia Pahang Pahang, Malaysia
[b]Faculty of Science and Information Technology Jadara University Jordan

ABSTRACT
Testing is a very important task to build error free software. As the resources and time to market is limited for a software product, it is impossible to perform exhaustive test i.e., to test all combinations of input data. To reduce the number of test cases in an acceptable level, it is preferable to use higher interaction level (t way, where t ≥ 2). Pairwise (2-way or t = 2) interaction can find most of the software faults. This paper proposes an effective random search based pairwise test data generation algorithm named R2Way to optimize the number of test cases. Java program has been used to test the performance of the algorithm. The algorithm is able to support both uniform and non-uniform values effectively with performance better than the existing algorithms/tools in terms of number of generated test cases and time consumption.

KEYWORDS:
Combinatorial interaction testing; Software testing; Pairwise testing; Test case generation

REFERENCES

1. Y. Lei, R. Kacker, D.R. Kuhn, V. Okun, and J.Lawrence, "IPOG: A general strategy for t-way software testing," in proceedings of the 14th Annual IEEE International Conference and Workshops on the Engineering and Computer-Based Systems, Tucson, Arizona, 2007.

2. Yingxia Cui, Longshu Li, Sheng Yao "A New strategy for pairwise test case generation" in proceedings of the third international Symposium on Intelligent Information Technology Application, NanChang, China, 2009.

3. Mohammed I. Younis, Kamal Z. Zamli, Nor Ashidi Mat Isa "Algebraic Strategy to Generate Pairwise Test Set for Prime Number Parameters and Variables" in proceedings of the IEEE international conference on computer and information technology, Kuala Lumpur, Malaysia, 2008.

4. Xiang Chen, Qing Gu, Jingxian Qi, Daoxu Chen "Applying Particle Swarm optimization to Pairwise Testing" in proceedings of the 34th Annual IEEE Comp

5. Mohammad F. J. Klaib, Sangeetha Muthuraman, Noraziah Ahmad, and Roslina Sidek "A Tree Based Strategy for Test Data Generation and Cost Calculation for Uniform and Non-Uniform Parametricc