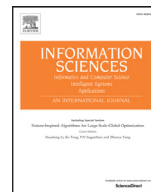




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# An experimental study of hyper-heuristic selection and acceptance mechanism for combinatorial $t$ -way test suite generation



Kamal Z. Zamli<sup>a,\*</sup>, Fakhrud Din<sup>a</sup>, Graham Kendall<sup>b</sup>, Bestoun S. Ahmed<sup>c</sup>

<sup>a</sup> IBM Centre of Excellence, Faculty of Computer Systems and Software Engineering, Universiti Malaysia Pahang, Lebuhraya Tun Razak, 26300 Kuantan, Pahang Darul Makmur, Malaysia

<sup>b</sup> School of Computer Science, University of Nottingham Malaysia Campus, Jalan Broga, 43500 Semenyih, Selangor Darul Ehsan, Malaysia

<sup>c</sup> Department of Computer Science, Faculty of Electrical Engineering, Czech Technical University Karlovo n'am 13, 121 35 Praha 2, Czechia

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### ABSTRACT

Recently, many meta-heuristic algorithms have been proposed to serve as the basis of a  $t$ -way test generation strategy (where  $t$  indicates the interaction strength) including Genetic Algorithms (GA), Ant Colony Optimization (ACO), Simulated Annealing (SA), Cuckoo Search (CS), Particle Swarm Optimization (PSO), and Harmony Search (HS). Although useful, meta-heuristic algorithms that make up these strategies often require specific domain knowledge in order to allow effective tuning before good quality solutions can be obtained. Hyper-heuristics provide an alternative methodology to meta-heuristics which permit adaptive selection and/or generation of meta-heuristics automatically during the search process. This paper describes our experience with four hyper-heuristic selection and acceptance mechanisms namely Exponential Monte Carlo with counter (EMCQ), Choice Function (CF), Improvement Selection Rules (ISR), and newly developed Fuzzy Inference Selection (FIS), using the  $t$ -way test generation problem as a case study. Based on the experimental results, we offer insights on why each strategy differs in terms of its performance.

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