

An elitist-flower pollination-based strategy for constructing sequence and sequence-less t-way test suite

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Abstract

In line with the upcoming of a new field called search-based software engineering (SBSE), many newly developed t-way strategies adopting meta-heuristic algorithms can be seen in the literature for constructing interaction test suite (such as simulated annealing (SA), genetic algorithm (GA), ant colony optimisation algorithm (ACO), particle swarm optimisation (PSO), harmony search (HS) and cuckoo search (CS)). Although useful, most of the aforementioned t-way strategies have assumed sequence-less interactions amongst input parameters. In the case of reactive system, such an assumption is invalid as some parameter operations (or events) occur in sequence and hence, creating a possibility of bugs triggered by the order (or sequence) of input parameters. If t-way strategies are to be adopted in such a system, there is also a need to support test data generation based on sequence of interactions. In line with such a need, this paper presents a unified strategy based on the new meta-heuristic algorithm, called the elitist flower pollination algorithm (eFPA), for sequence and sequence-less coverage. Experimental results demonstrate the proposed strategy gives sufficiently competitive results as compared with existing works.

Keywords: t-way testing; flower pollination algorithm; event sequence testing; combinatorial problem; meta-heuristics; optimisation problem.