Engineering Applications of Artificial Intelligence 59 (2017) 35–50

Contents lists available at ScienceDirect

Engineering Applications of Artificial Intelligence

journal homepage: www.elsevier.com/locate/engappai

Fuzzy adaptive teaching learning-based optimization strategy for the problem of generating mixed strength *t*-way test suites

Kamal Z. Zamli[a,*], Fakhrud Din[a], Salmi Baharom[b], Bestoun S. Ahmed[c]

[a] *IBM Centre of Excellence, Faculty of Computer Systems and Software Engineering, Universiti Malaysia Pahang, Lebuhraya Tun Razak, 26300 Kuantan, Pahang Darul Makmur, Malaysia*

[b] *Faculty of Computer Science and Information Technology, Universiti Putra Malaysia, Malaysia*

[c] *Department of Computer Science, Faculty of Electrical Engineering Czech Technical University Karlovo n´am. 13, 121 35 Praha 2, Czech Republic*

ARTICLE INFO

Keywords:
Software testing
t-way testing
Teaching learning-based optimization algorithm
Mamdani fuzzy inference system

ABSTRACT

The teaching learning-based optimization (TLBO) algorithm has shown competitive performance in solving numerous real-world optimization problems. Nevertheless, this algorithm requires better control for exploitation and exploration to prevent premature convergence (i.e., trapped in local optima), as well as enhance solution diversity. Thus, this paper proposes a new TLBO variant based on Mamdani fuzzy inference system, called ATLBO, to permit adaptive selection of its global and local search operations. In order to assess its performances, we adopt ATLBO for the mixed strength *t*-way test generation problem. Experimental results reveal that ATLBO exhibits competitive performances against the original TLBO and other meta-heuristic counterparts.