An optimization approach for automated unit test generation tools using multi-objective evolutionary algorithms

Ramadan Moawad ,Samar Ali Abdallah , Esaam Eldeen Fawzy

Abstract

High code coverage is measured by the process of software testing typically using automatic test case generation tools. This standard
approach is usually used for unit testing to improve software reliability. Most automated test case generation tools focused just on code coverage
without considering its cost and redundancy between generated test cases. To obtain optimized high code coverage and to ensure minimum cost
and redundancy a Multi-Objectives Evolutionary Algorithm approach (MOEA) is set in motion. An efficient approach is proposed and applied to
different algorithms from MOEA Frame from the separate library with three fitness functions for Coverage, Cost, and Redundancy. Four MEOA
algorithms have been proven reliable to reach above the 90 percent code coverage: NSGAII, Random, SMSEMOA,v and   /MOEA. These four
algorithms are the key factors behind the MOEA approach.