

# A Self-Adapting Ant Colony Optimization Algorithm Using Fuzzy Logic (ACOF) for Combinatorial Test Suite Generation

## **Abstract**

Software testing is one of most crucial phase in software development life cycle (SDLC). The main function of testing is to cater bugs between interactions of the inputs. It is not possible to eliminate all bugs in one system but by using a suitable testing optimization, it can provide a good enough solution for it. Reducing effort on this phase is not only could lead to numerous bugs between the input interactions, but it also leads to a greater loss such as loss of profits, reputations and even loss of life. Generally, there are three categories of combinatorial testing techniques which is computational, metaheuristic, and hyper heuristic. Ant colony optimization (ACO) is a heuristic technique where its mimic the nature of ants in finding the best route from the nest to the food node and vice versa. Many optimization problems have been solved by using ACO. This paper is to proposed a self-adapting ant colony optimization algorithm using fuzzy logic (ACOF) for combinatorial test suite generation, where it will dynamically determine number of ants and edge selection (i.e. either to explore or to exploit) based on percentage of remaining tuple list and covered test cases.

## **Keywords**

Ant Colony Optimization; Combinatorial testing; T-way testing