

# **Proposed Test Case Generation Model Using Fuzzy Logic**

By

**Mustafa Shuker Mahmood**

Supervisor

**Dr. Ahmed Althunibat**

**Al-Zaytoonah University of Jordan,2021**

## **Abstract**

Software testing is a process for ensuring the delivery of error-free software to clients, determines whether a software achieves its desired outcome, this process consumes a significant amount of cost and time in all software industries in the life cycle of software development.

Automatic testing is an important area where the cost and time of the software testing process are considerably reduced when comparing to manual testing structure-oriented methods, automatic and highly efficient tools have been still missed generating the basis paths in white-box testing.

In this thesis, an automatic and efficient method is proposed for the production of basis paths the model begins by converting the source-code program into a control flow graph (CFG) using a related library, CFG is designed to generate all test paths automatically from CFG. We have developed an algorithm for generating test path (AGTP) that traverses each node in CFG from the source to the destination, then generates a set of inputs and then clusters these inputs into groups by using k-mean clustering and check the path coverage for each cluster, finally the optimal path will be obtained by fuzzy logic. Through evaluation of more than one example, the proposed model is proved to be correct and capable of generating test cases.

## **Keywords**

Software Testing; Fuzzy logic (FL); k-mean clustering; Basis Path Testing; Automatic test case generation