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COMP3211 Homework One

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1 Paper Summary

Fault localization is the most expensive debugging activity. There are five main methods investigated by researchers to automate the process of looking for faults. In existing work, researchers found that *Case Transitions* performs much better than other approaches: *Set Union*, *Set Intersection* and *Nearest Neighbor*. This paper discusses the evaluation of fault-localization performance of *Tarantula* – another method in the five – compared with other four.

The result in this paper shows that Tarantula always outperforms other four techniques in terms of effectiveness. It has also almost the same cost as the most efficient techniques. It can pinpoint much more faults than others in the same score-level. The percentage of programs that do not need be examined to locate the faults are concerned in this result. Case-transitions and Tarantula are more effective than the other three.

A basic introduction to the Tarantula approach is conducted. It is a method whose idea is entities which primarily executed by failed test cases are more likely to be faulty, and it utilizes standard testing information. An explanation of existing empirical studies is stated as well.

References

[1] James A. Jones and Mary Jean Harrold. *Empirical Evaluation of the Tarantula Automatic Fault-Localization Technique*. Proceedings of the IEEE/ACM International Conference on Automated Software Engineering (ASE'05), pp. 273-282, 2005.