

COMP3211 Homework Two

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1 PAPER SUMMARY

In this paper, a **crosstab-based statistical method** used for *fault localization* utilizing the coverage information of each executable statement and the testing results is proposed. Comparing to existing methods using runtime information or static analyses which are based on practitioners' intuitive, this method uses a well-defined statistical analysis model to locate faults.

Model design is like the following: for each executable statement, a crosstab is constructed which can reflect the suspiciousness of this statement. A crosstab can be considered as a cross-classification table contains successful or failed executions for the test cases which can either cover this specific statement or not. After obtaining the crosstab for each statement, a suspiciousness index ζ can be computed through calculating Chi-square test, contingency coefficient, and statistics. Among all statements, the one with the highest suspiciousness index ζ will be examined first.

According to the experiments from case studies on the seven programs in the Siemens suite and ten utility programs in a Unix suite, the crosstab-based method is effective and performs better than other methods such as Tarantula. The efficiency level between crosstab-based method and Tarantula is almost the same.

REFERENCES

- [1] Wong, E., Wei, T., Qi, Y., Zhao, L. (2008, April). A crosstab-based statistical method for effective fault localization. In *Software Testing, Verification, and Validation, 2008 1st International Conference on* (pp. 42-51). IEEE.