

# Analysis of Size Differences Between Static and Dynamic Slices

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Program slicing provides great support in executing software engineering tasks, eg. debugging errors, maintenance, testing, reengineering, thus the purpose of my paper is a more sophisticated analysis of the two kind of slicing: dynamic and static slicing.

The backward program slice is a subset of the program which contains the statements that have direct or indirect effect on a certain variable occurrence of a certain program point(criteria). The forward program slice is a subset of the program which contains the statements that have direct or indirect dependence on a certain program point.

In the case of static slicing, the dependencies occurring during all the possible program executions appear. Dynamic slicing, which is exact for a given testcase, results in realized dependencies belonging to a concrete execution. Compared to the static slice, the number of dependencies are lower. Union slicing, which is the union of dynamic slices for the same criteria in different testcases, provides a solution for this problem.

On the basis of the data calculated with the help of the Jadys union dynamic slicer developed by the Software Engineering Department of Szeged and the Indus static slicer developed by a research group of Kansas State University the received statement level slices are compared. In a previous article[1] only the sizes of the slices was measured, but in this paper I examine the causes of differences between the sizes of the slices through concrete examples.

The examination brings up two major causes as an explanation for these differences: firstly, there are statements which could appear in the dynamic slice by adding a new testcase, secondly, there are the statements which are included in the static slice because of the conservative approach of static slicing. The goal is to separate these causes as much as possible and with the help of this to give recommendations for the further improvement of slicing methods.

## References

- [1] Attila Szegedi, Tamás Gergely, Árpád Beszédes, Tibor Gyimóthy, Gabriella Tóth. Verifying the Concept of Union Slices on Java Programs, CSMR 2007