

Abstract

# Activation Order Analysis of Context-oriented Programs Based on Resource Usage Analysis

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Context-oriented programming (COP) languages help programmers to modularize behavioral variations that depend on contexts such as execution environments and internal states of the program. The programmer specifies when and which variations get activated explicitly. This paper addresses the following two issues in context-oriented programs. First, it is hard to check whether each variation is activated according to the specification of the program. Second, programs written in COP languages are generally not efficient from the view point of runtime performance, because there is an overhead to check whether each variation is activated at runtime. All these issues fall into the problem to find a sound order of activation with respect to the specification of the program. As a foundation to address the problem, this paper proposes a type-based analysis to check whether or not the program activates each behavioral variation correctly, i.e., the inferred order is a subset of the one described in the specification. The analysis is based on the resource usage analysis proposed by Igarashi and Kobayashi. It models a value that records a set of active variations as a resource, and an operation that activates a variation as use.

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