

## A Formal Property Verification for Aspect-Oriented Programs in Software Development

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**Abstract :** Software development for complex systems requires efficient and automatic tools that can be used to verify the satisfiability of some critical properties such as security ones. With the emergence of Aspect-Oriented Programming (AOP), considerable work has been done in order to better modularize the separation of concerns in the software design and implementation. The goal is to prevent the cross-cutting concerns to be scattered across the multiple modules of the program and tangled with other modules. One of the key challenges in the aspect-oriented programs is to be sure that all the pieces put together at the weaving time ensure the satisfiability of the overall system requirements. Our paper focuses on this problem and proposes a formal property verification approach for a given property from the woven program. The approach is based on the control flow graph (CFG) of the woven program, and the use of a satisfiability modulo theories (SMT) solver to check whether each property (represented par one aspect) is satisfied or not once the weaving is done.

**Keywords :** aspect-oriented programming, control flow graph, property verification, satisfiability modulo theories

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