Presentation Abstract

The Translation Validation for the Coarse-grain Parallelizing Compiler

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Program optimization passes performed by an automatically parallelizing compiler require highly sophisticated transformations of a source program. The compiler must preserve the behavior of the source program with the parallelized program. However, there is a risk of introducing bugs in such optimization passes that silently modify the semantics of the program, and it is difficult to detect these bugs until program execution time and potentially not even then. In this presentation, based on a task graph obtained from a source program, we provide a translation validation technique, which validates that the task related program properties, such as partial order among tasks and task-set to be executed, are preserved before and after compiler transformations. These relations are derived from edges in the graph consisting of both data and control dependencies. The implemented translation validator is evaluated with the OSCAR parallelizing compiler and a set of C programs generated by Embedded Coder from MATLAB/Simulink models.

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