Towards an Orchestrated Approach for Annotation Verification

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Worst-case execution time (WCET) analyzers commonly rely on user-provided annotations such as loop bounds, recursion depths, region- and program constants. This introduces a trusted annotation base into WCET analysis without any guarantee that the user-provided annotations are safe and tight. This prevents to formally prove safety and accuracy of a WCET analysis.

In this talk we propose a uniform and flexible approach, which reduces the trusted annotation base to a minimum, while simultaneously tightens time bounds. Fundamental is the orchestrated application of various program analysis methods from data-flow analysis to model checking to theorem proving for proving or disproving relevant time bounds of a program. First practical experiences using the sample programs of the Mälardalen benchmark suite demonstrate the usefulness of the overall approach. The approach as such, however, is not restricted to WCET analysis and applies to other domains as well.