

# Source-to-Source Transformations for WCET: The COSTA Approach \*

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## Abstract

*Worst-case execution time* (WCET) analysis is an indispensable prerequisite for the successful design and development of systems, which in addition to functional constraints also have to satisfy hard real-time constraints. In order to precisely estimate the WCET of a program, WCET tools usually rely on user-provided *annotations* such as loop-bounds or execution frequencies of program statements which allow them to separate feasible from infeasible program paths. Typically, WCET-analysis tools analyse the object-code of a program, since this is the code that is actually executed. For a programmer, however, it is much more demanding to annotate object code than high-level source code. Exempting the programmer from this burden, however, imposes new responsibilities on the compiler: source code annotations must safely be transformed to equivalent object code annotations.

In this talk we present the CoSTA-project (*Compiler Support for Timing Analysis*) which aims to support this transformation process. In this project, which has recently been started, this process is decomposed into a two-stage process as illustrated in Figure 1. In the talk, we will focus on the first stage of this process, the *high-level source-to-source compiler*.

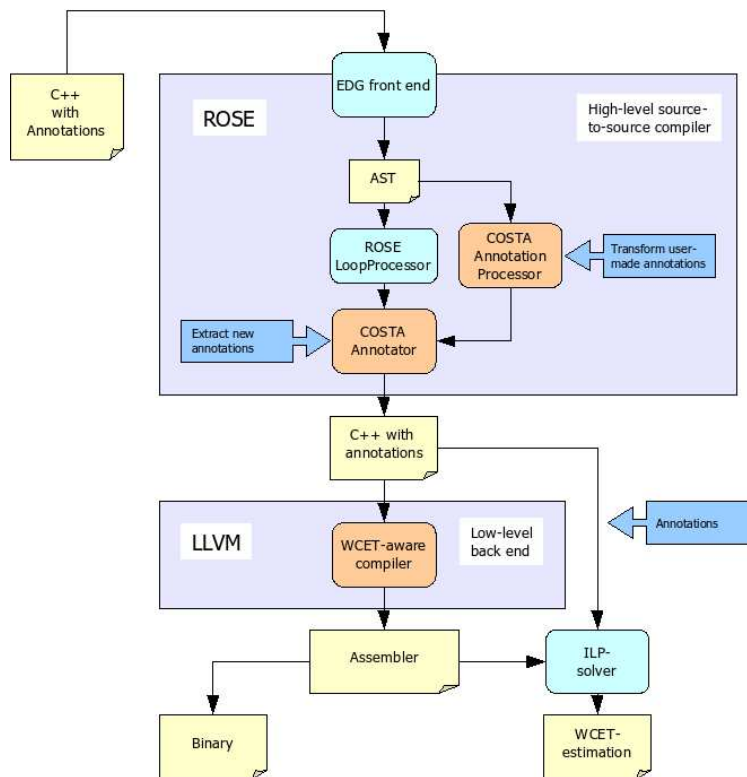


Figure 1: A flowchart of the COSTA architecture

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