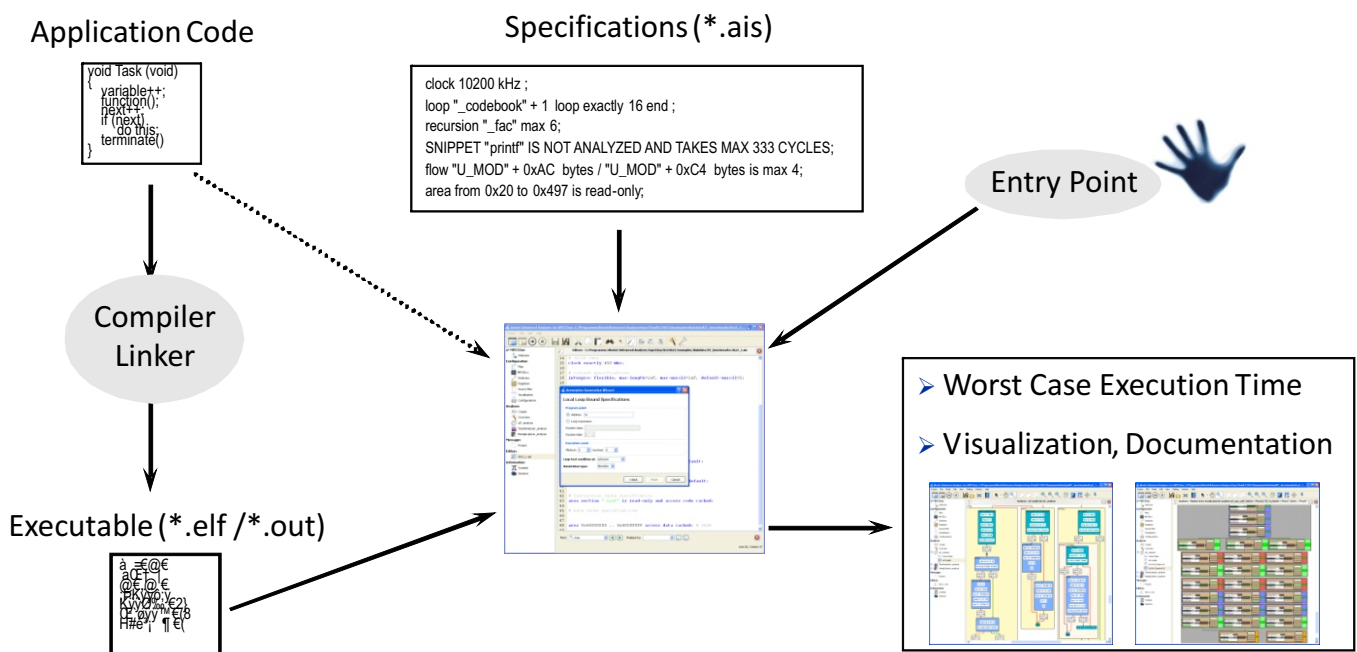


aiT Worst-Case Execution Time Analyzer

Timing Validation for Real-Time Systems

aiT WCET Analyzer computes **tight bounds** for the **worst-case execution time of tasks** in safety-critical systems. These bounds are **safe**, i.e. they are **valid for any input scenario** and each task execution.

aiT is based on **statically analyzing** a task's intrinsic **cache and pipeline behavior**, thus enabling the development of complex hard real-time systems on **state-of-the-art hardware**.



The Challenge:

- **Measuring** the execution time of a task is typically **not safe**. It is often impossible to prove that all the conditions determining maximum execution time are taken into account. Instrumentation and debug information change the timing behavior.
- Analysis methods that do not consider **cache and pipeline behavior** typically seriously overestimate the WCET.
- Switching off instruction and data caches to simplify WCET prediction can lead to severe performance degradation (by a factor of up to 30 for the PowerPC 604, according to a study by EADS).

This is where aiT steps in:

- aiT-computed bounds are **valid for all inputs** and each execution of a task. Extensive timing testing is now a thing of the past.
- aiT directly analyzes binary executables. This means that **no modification of your tool chain** or the program's operational behavior and performance is required.
- aiT-computed bounds are tight and reflect the **real performance** of your system. Cache and pipeline effects are fully taken into account. Ensuring deadline adherence is no longer done at the expense of hardware resources.

