

Static Analysis under a Given Time Budget

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Goal

Static analyses by abstract interpretation are often guaranteed to terminate in finite time. However, it would be beneficial to be able to specify resource constraints (time, memory) that a static analyzer should respect, even if the precision of the analysis has to be reduced. An immediate usecase is the software verification competition [3], which limits each verification task using 15 minutes of CPU time and 8GB of RAM. We are submitting our static analyzer [4], called Mopsa, to this competition this year. We currently aim at running Mopsa through more and more expensive and precise analyses, until (a) the program is proved correct or (b) the resources are exhausted.

The goal of this internship is to develop techniques to estimate how long an analysis is going to take on a given program. A starting point could be to develop an offline method, acting as a pre-analysis, estimating the complexity of the analysis of a program, possibly as a symbolic formula (Ballabriga et al [2]).

Useful Prerequisites

- Background in formal methods, especially static analysis and abstract interpretation.
- Knowledge of functional programming (Mopsa is written in OCaml).

Location

The internship is proposed within Inria's [SyCoMoRES](#) team, hosted in the CRISAL laboratory, near [Lille](#).

References

1. [A progress bar for static analyzers](#), Lee, Oh, Yi
2. [Symbolic WCET computation](#), Ballabriga, Forget, Lipari
3. [Competition on Software Verification](#)
4. [The Mopsa Static Analysis Platform](#)