

Micro-Benchmarking Considered Harmful

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ABSTRACT

Measuring the time spent on small individual fractions of program code is a common technique for analysing performance behavior and detecting performance bottlenecks. The benefits of the approach include a detailed individual attribution of performance and understandable feedback loops when experimenting with different code versions. There are however severe pitfalls when following this approach that can lead to vastly misleading results. Modern dynamic compilers use complex optimisation techniques that take a large part of the program into account. There can be therefore unexpected side-effects when combining different code snippets or even when running a presumably unrelated part of the code. This talk will present performance paradoxes with examples from the domain of dynamic compilation of Java programs. Furthermore, it will discuss an alternative approach to modelling code performance characteristics that takes the challenges of complex optimising compilers into account.

CCS Concepts/ACM Classifiers

- Software and its engineering ~ Dynamic compilers

Author Keywords

Compilers; benchmarking; performance; compiler optimisations; dynamic compilation;

BIOGRAPHY

Thomas Wuerthinger is a Senior Research Director at Oracle Labs leading programming language implementation teams for languages including Java, JavaScript, Ruby, and R. He is the architect of the Graal compiler and the Truffle self-optimising runtime system. Previously, he worked on the Crankshaft optimising compiler of V8 at Google, and the Maxine research virtual machine at Sun Microsystems. He received a PhD degree from JKU Linz for his research about dynamic code evolution.



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