



Engineering: A Compiler

By Keith Cooper, Linda Torczon

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Editorial Review

Amazon.com Review

This entirely revised second edition of *Engineering a Compiler* is full of technical updates and new material covering the latest developments in compiler technology. In this comprehensive text you will learn important techniques for constructing a modern compiler. Leading educators and researchers Keith Cooper and Linda Torczon combine basic principles with pragmatic insights from their experience building state-of-the-art compilers. They will help you fully understand important techniques such as compilation of imperative and object-oriented languages, construction of static single assignment forms, instruction scheduling, and graph-coloring register allocation.

Compiler development today focuses on optimization and on code generation. A newly hired compiler writer is far more likely to port a code generator to a new processor or modify an optimization pass than to write a scanner or parser. The successful compiler writer must be familiar with current best-practice techniques in optimization, such as the construction of static single-assignment form, and in code generation, such as software pipelining. They must also have the background and insight to understand new techniques as they appear during the coming years. Finally, they must understand the techniques of scanning, parsing, and semantic elaboration well enough to build or modify a front end. Our goal for the second edition of *Engineering a Compiler* has been to create a text and a course that exposes students to the critical issues in modern compilers and provides them with the background to tackle those problems. We have retained, from the first edition, the basic balance of material. Front ends are commodity components; they can be purchased from a reliable vendor or adapted from one of the many open-source systems. At the same time, optimizers and code generators are custom-crafted for particular processors and, sometimes, for individual models, because performance relies so heavily on specific low-level details of the generated code. These facts affect the way that we build compilers today; they should also affect the way that we teach compiler construction.

Read a Sample Chapter from *Engineering a Compiler* on "Practical Issues"

Even with automatic parser generators, the compiler writer must manage several issues to produce a robust, efficient parser for a real programming language. This chapter addresses several issues that arise in practice.

Review

"Keith Cooper and Linda Torczon are leading compilers researchers who have also built several state-of-the-art compilers. This book adeptly spans both worlds, by explaining both time-tested techniques and new algorithms, and by providing practical advice on engineering and constructing a compiler. *Engineering a Compiler* is a rich survey and exposition of the important techniques necessary to build a modern compiler." --**Jim Larus**, Microsoft Research "The book is well written, and well supported with diagrams, tables, and illustrative examples. It is a suitable textbook for use in a compilers course at the undergraduate or graduate level, where the primary focus of the course is code optimization." --**ACM's Computing Reviews.com** "This book is a wealth of useful information, prepared didactically, with many helpful hints, historical indications, and suggestions for further reading. It is a helpful working book for undergraduate and intermediate-level students, written by authors with an excellent professional and teaching background. An engineer will use the book as a general reference. For special topics, an ambitious reader will consult more recent publications in the subject area." --**ACM's Computing Reviews.com** About the Author Dr. Cooper, Professor, Dept. of Computer Science at Rice University, is the leader of the Massively Scalar Compiler Project at Rice, which investigates issues relating to optimization and code generation for modern

machines. He is also a member of the Center for High Performance Software Research, the Computer and Information Technology Institute, and the Center for Multimedia Communication -- all at Rice. He teaches courses in Compiler Construction at the undergraduate and graduate level.

Linda Torczon is a principal investigator on the Massively Scalar Compiler Project at Rice University, and the Grid Application Development Software Project sponsored by the next Generation Software program of the National Science Foundation. She also serves as the executive director of HiPerSoft and of the Los Alamos Computer Science Institute. Her research interests include code generation, interprocedural dataflow analysis and optimization, and programming environments. **Users Review****From reader reviews:**

Alex Jose: This Engineering: A Compiler book is simply not ordinary book, you have it then the world is in your hands. The benefit you get by reading this book is information inside this book incredible fresh, you will get details which is getting deeper a person read a lot of information you will get. This specific Engineering: A Compiler without we know teach the one who examining it become critical in contemplating and analyzing. Don't always be worry Engineering: A Compiler can bring whenever you are and not make your carrier space or bookshelves' turn into full because you can have it inside your lovely laptop even cell phone. This Engineering: A Compiler having great arrangement in word along with layout, so you will not sense uninterested in reading.

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