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LLVM Essentials

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LLVM Essentials

Become familiar with the LLVM infrastructure and start using LLVM libraries to design a compiler

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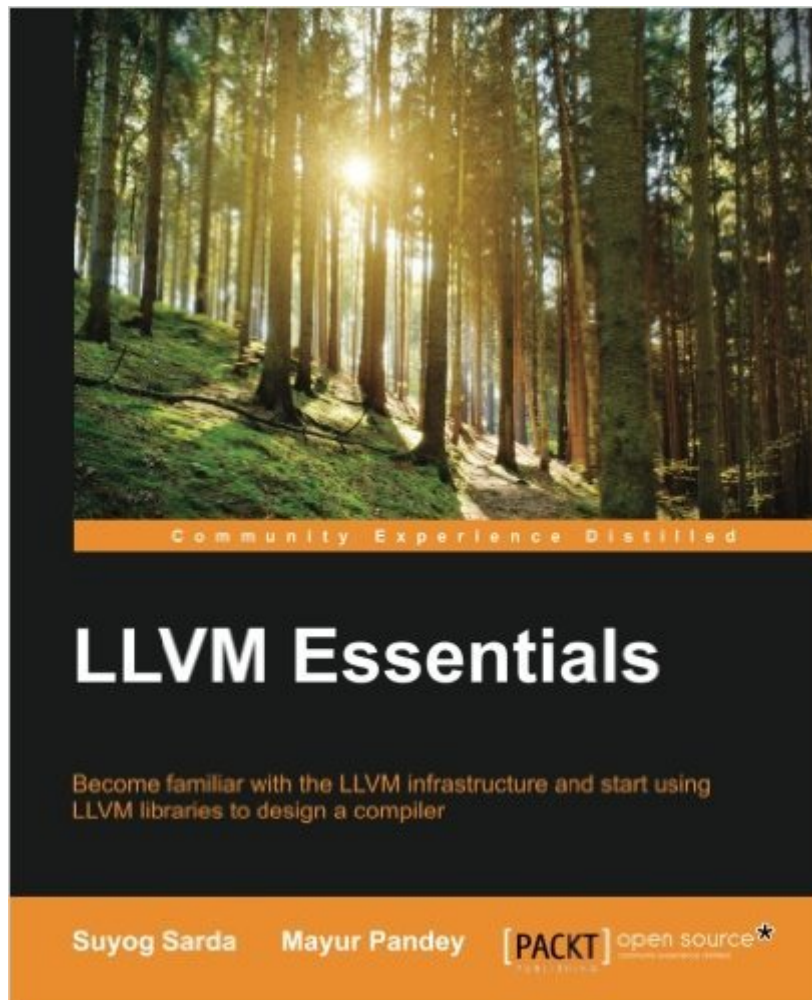
Synopsis

Become familiar with the LLVM infrastructure and start using LLVM libraries to design a compilerAbout This BookLearn to use the LLVM libraries to emit intermediate representation (IR) from high-level languageBuild your own optimization pass for better code generationUnderstand AST generation and use it in a meaningful wayWho This Book Is ForThis book is intended for those who already know some of the concepts of compilers and want to quickly get familiar with the LLVM infrastructure and the rich set of libraries that it provides.What You Will LearnGet an introduction to LLVM modular design and LLVM toolsConvert frontend code to LLVM IRImplement advanced LLVM IR paradigmsUnderstand the LLVM IR Optimization Pass Manager infrastructure and write an optimization passAbsorb LLVM IR transformationsUnderstand the steps involved in converting LLVM IR to Selection DAGImplement a custom target using the LLVM infrastructureGet a grasp of C's frontend clang, an AST dump, and static analysisIn DetailLLVM is currently the point of interest for many firms, and has a very active open source community. It provides us with a compiler infrastructure that can be used to write a compiler for a language. It provides us with a set of reusable libraries that can be used to optimize code, and a target-independent code generator to generate code for different backends. It also provides us with a lot of other utility tools that can be easily integrated into compiler projects.This book details how you can use the LLVM compiler infrastructure libraries effectively, and will enable you to design your own custom compiler with LLVM in a snap.We start with the basics, where you'll get to know all about LLVM. We then cover how you can use LLVM library calls to emit intermediate representation (IR) of simple and complex high-level language paradigms. Moving on, we show you how to implement optimizations at different levels, write an optimization pass, generate code that is independent of a target, and then map the code generated to a backend. The book also walks you through CLANG, IR to IR transformations, advanced IR block transformations, and target machines.By the end of this book, you'll be able to easily utilize the LLVM libraries in your own projects.Style and approachThis book deals with topics sequentially, increasing the difficulty level in a step-by-step approach. Each topic is explained with a detailed example, and screenshots are included to help you understand the examples.

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Customer Reviews

I knew nothing about LLVM and was going to start playing with it. The web has too much information for a rookie and the book just saved me some time in learning.

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