Introduction to LLVM compiler framework

Course outline

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Welcome slides

About the dragon

- The **LLVM logo** [1] is a stylized wyvern (a kind of dragon). Dragons have connotations of power, speed and intelligence, and can also be sleek, elegant, and modular (err, maybe not).

About the dragon

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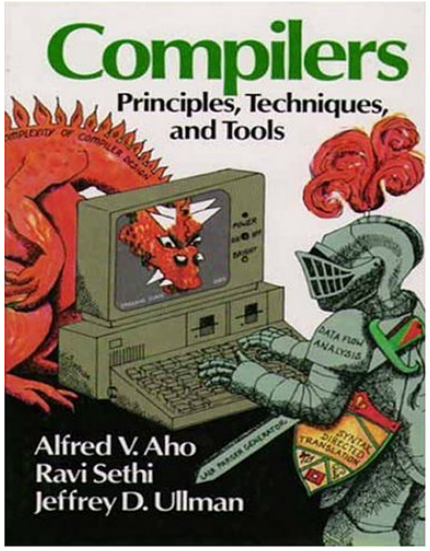
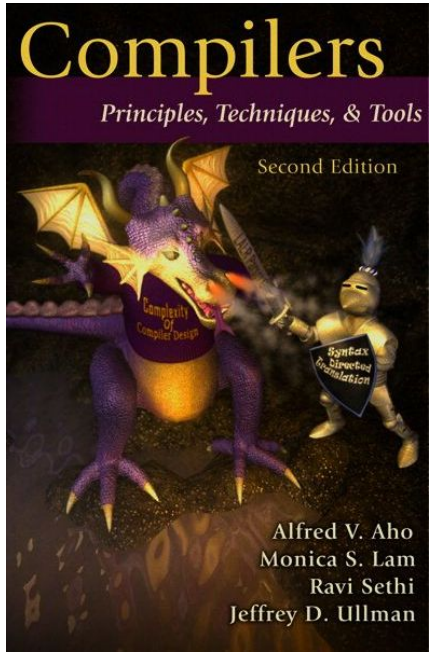
- There is a series of **compiler books** dating back to the 1970s showing illustrations with dragons and knights [2] [3] [4]





About me

Stefano Cherubin

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- PhD candidate @ Politecnico di Milano (Italy)

- working on compilers since not so long time
- definitly not an experienced knight...

About me

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- working on compilers since not so long time
- definitly not an experienced knight...
- ...I’m more like a lazy Hobbit

About you

In order to fully understand the content of this course you should have:

- knowledge of what a compiler is
- proficiency in most common data structures
- proficiency in Object-Oriented Programming
- at least some experience with C++

About the course

1. First part
   - Compiler design
   - LLVM structure overview
   - LLVM-IR language
2. Second part
   - LLVM Documentation
   - Available middle-end passes (overview)
     - Normalization
     - Analysis
   - LLVM quick start tutorial (depending on time)

Goal of the course

At the end of these lectures you should:

- understand the LLVM compiler infrastructure
- be able to read a .ll file (LLVM-IR)
- know where to look for documentation
- know which are the main middle-end weapons LLVM provides you out of the box
- know how to implement a simple analysis / transformation
- know how to test your code

Bibliography I


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Bibliography II

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