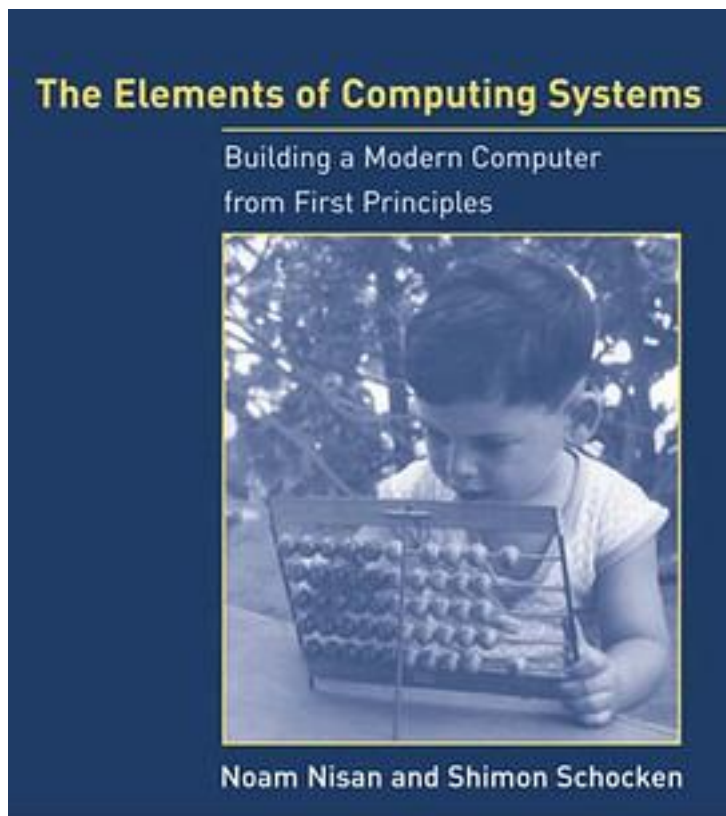


# The Elements of Computing Systems



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In the early days of computer science, the interactions of hardware, software, compilers, and operating system were simple enough to allow students to see an overall picture of how computers worked. With the increasing complexity of computer technology and the resulting specialization of knowledge, such clarity is often lost. Unlike other texts that cover only one aspect of the field, The Elements of Computing Systems gives students an integrated and rigorous picture of applied computer

science, as it comes to play in the construction of a simple yet powerful computer system. Indeed, the best way to understand how computers work is to build one from scratch, and this textbook leads students through twelve chapters and projects that gradually build a basic hardware platform and a modern software hierarchy from the ground up. In the process, the students gain hands-on knowledge of hardware architecture, operating systems, programming languages, compilers, data structures, algorithms, and software engineering. Using this constructive approach, the book exposes a significant body of computer science knowledge and demonstrates how theoretical and applied techniques taught in other courses fit into the overall picture. Designed to support one- or two-semester courses, the book is based on an abstraction-implementation paradigm; each chapter presents a key hardware or software abstraction, a proposed implementation that makes it concrete, and an actual project. The emerging computer system can be built by following the chapters, although this is only one option, since the projects are self-contained and can be done or skipped in any order. All the computer science knowledge necessary for completing the projects is embedded in the book, the only pre-requisite being a programming experience. The book's web site provides all tools and materials necessary to build all the hardware and software systems described in the text, including two hundred test programs for the twelve projects. The projects and systems can be modified to meet various teaching needs, and all the supplied software is open-source.

作者介绍:

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标签

计算机科学

计算机

计算机系统

CS

MIT

计算

systems

sys

## 评论

:无

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## 书评

不知道有多少人像我一样，在看了Shimon Schocken的那个TED演讲之后对这门网络课程产生了兴趣；也不知道有多少人像我一样，坚持做完了整本书的项目。在断断续续3个月的学习过程中，我对计算机有了更加深入的认识，同时，超过1500行的代码和一个个实打实的project给了我前所未有...

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读这本书最大的收获，原来设计一个“从内存中读取指令并执行”的电路并不如想象中那么复杂，用几十个D触发器加一堆逻辑门就能搞出来。  
当然，要把这么多内容放到一本书里，必然有很多省略之处。  
数字电路方面，模型比较理想化，要想真的用TTL或FPGA实现Hack还有一些现实的困难...

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官方网站，上面有 PPT 和软件：[<http://www.nand2tetris.org/>] Coursera 上的公开课  
第一部分：[<https://www.coursera.org/learn/build-a-computer>]  
第二部分：[<https://www.coursera.org/learn/nand2tetris2>]  
另外希望大家在看的过程中顺便贡献中文字幕。

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多的就不说了，这本书从头到尾介绍了如何自己实现一台计算机，尽管只是一个小板凳，但是世界就是从这里开始的。如果有兴趣，来吧，我们自己做一个吧。  
我本人除了最后的类库以外，全部实现了。

不论你是对硬件实现有兴趣，还是对软件实现有兴趣，可以加这个群，一个讨论...

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【缘起】一直想了解现代计算机是如何构建起来的，偶然间看到 [Shimon Schocken] 在 [TED] 的一期演讲，介绍其为学生开发了一套逐步构建现代计算机的课程，该课程让大家了解现代计算机如何从基本门电路开始慢慢被构建。【体会】正如本书作者所言，此书强调实践，一味的端着书...

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<http://blog.csdn.net/chief1985/archive/2008/04/20/2309634.aspx>

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不得不说，这简直是一本神书。以前，学了模电、数电，知道了逻辑电路与时序电路；学了微机、单片机，有个计算机的雏形；学了汇编，知道计算机的工作方式；之后学了 C、Java、PHP 各种高级语言，知道了怎么编程；学了 Linux，了解了操作系统；之后又接触了数据结构，编译器。尽管如...

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仅作者对于知识内容的组织就已经令人受益良多了。  
去掉各种华丽和过多的工业级强度带来的细节，更容易让人看到问题的本质。

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[<https://github.com/Bozar/Nand2Tetris>]  
前八章习题全部完成，个别难题（ALU、PC、CPU 和汇编器）代码里有注释。后面四章不打算做了。因为最后几章知识点密度太大，哪怕根据文档写完代码，也没搞懂太多内容。  
绝大部分题目都可以独立完成的，只要把书读懂了就行。但是第八章...

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首先，这本书可以作为学习计算机系统的入门书先看看，主要是要实践，把 CPU 和编译器做完后会发现自己很有成就感，这时候自信心和兴趣都会有所提高，然后继续看些较深入的计算机体系结构的书。  
书中对每个项目都有循序渐进的方案实行，这样会让我们对项目有一个很好的习惯：循序...

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冲着"从零开始"去看,发现书很薄,有些疑惑.读毕第三章已经不想看了,讲的比较浅.然后又搞了个 Jack 语言,比较讨厌这口写法,无心再去理会语法,快速翻完.  
要真想学,还是去看<深入理解>比较合适,比这个过瘾.这个相比来说只能算个初级科普读

物,啥都提到,啥都一小段完事.

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