



Design and Analysis
of Algorithms I

Introduction

Why Study Algorithms?

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- important for all other branches of computer science

计算机领域的许多分支，理解基础算法与数据结构很重要

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- plays a key role in modern technological innovation

在现代科技中算法也扮演中重要的角色：搜索引擎使用tapestry算法
谷歌搜索使用page rank算法

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 - “Everyone knows Moore’s Law – a prediction made in 1965 by Intel co-founder Gordon Moore that the density of transistors in integrated circuits would continue to double every 1 to 2 years....in many areas, performance gains due to improvements in algorithms have vastly exceeded even the dramatic performance gains due to increased processor speed.”
 - Excerpt from *Report to the President and Congress: Designing a Digital Future*, December 2010 (page 71).

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- plays a key role in modern technological innovation
- provides novel “lens” on processes outside of computer science and technology
 - quantum mechanics, economic markets, evolution

算法正在越来越多地运用到计算机科学与技术以外的领域：

1. 量子计算机的研究
2. 市场经济的价格波动

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- challenging (i.e., good for the brain!)

学习算法具有挑战性，这是对大脑的一种锻炼！

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- challenging (i.e., good for the brain!)
- fun

可以从学习算法中获得乐趣！