Computer Science

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Contents

Chapter 1

Wikipedia's

1.1 Wikipedia/Computer Science

Fundamental areas of computer science. Programming language theory, Computational complexity theory, Artificial intelligence, Computer architecture. History, Outline, Glossary, Category.

Computer science is the study of computation, automation, & information. Computer science spans theoretical disciplines (such as algorithms, theory of computation, & information theory) to practical disciplines (including the design & implementation of hardware & software). Computer science is generally considered an area of academic research & distinct from computer programming.

Algorithms & data structures are central to computer science. The theory of computation concerns abstract models of computation & general classes of problems that can be solved using them. The fields of cryptography & computer security involve studying the means for secure communication & for preventing security vulnerabilities. Computer graphics & computational geometry address the generation of images. Programming language theory considers approaches to the description of computational processes, & database theory concerns the management of repositories of data. Human–computer interaction investigates the interfaces through which humans & computers interact, & software engineering focuses on the design & principles behind developing software. Areas such as operating systems, networks & embedded systems investigate the principles & design behind complex systems. Computer architecture describes the construction of computer components & computer-operated equipment. Artificial intelligence & machine learning aim to synthesize goal-orientated processes such as problem-solving, decision-making, environmental adaptation, planning & learning found in humans & animals. Within artificial intelligence, computer vision aims to understand & process image & video data, while natural-language processing aims to understand & process textual & linguistic data.

The fundamental concern of computer science is determining what can & cannot be automated. The Turning Award is generally recognized as the highest distinction in computer science." – Wikipedia/computer science

1.1.1 History

1.1.2 Etymology

1.1.3 Philosophy

Epistemology of computer science

Paradigms of computer science

1.1.4 Fields

Theoretical computer science

Theory of computation.

Information & coding theory.

Data structures & algorithms.

Programming language theory & formal methods.

Computer systems & computational processes

Artificial intelligence.

Computer architecture & organization.

Concurrent, parallel & distributed computing.

Computer networks.

Computer security & cryptography.

Databases & data mining.

Computer graphics & visualization.

Image & sound processing.

Applied computer science

Computational science, finance & engineering.

Social computing & human–computer interaction.

Software engineering.

1.1.5   Discoveries

1.1.6   Programming paradigms

1.1.7   Academia

1.1.8   Education

Chapter 2

The Art of Computer Programming

2.1 The Art of Computer Programming (TAOCP)

"At the end of 1999, these books were named among the best 12 physical-science monographs of the century by American Scientists, along with: Dirac on quantum mechanics, Einstein on relativity, Mandelbrot on fractals, Pauling on the chemical bond, Russell & Whitehead on foundations of mathematics, von Neumann & Morgensstern on game theory, Wiener on cybernetics, Woodward & Hoffmann on orbital symmetry, Feynmann on quantum electrodynamics, Smith on search for structure, & Einstein's collected papers. Wow" "historic" publisher's brochure from the 1st edition of Vol. 1 (1968). A complimentary *downloadable PDF containing the collected indexes* is available from the publisher to registered owners of the 4-volume boxed set. This PDF also includes the complete indexes of Vols. 1, 2, 3, & 4A, as well as to Vol. 1 Fascicle 1 & to Vol. 4 Fascicles 5 & 6."

2.1.1 eBook versions

"These volumes are now available also in portable electronic form, using PDF format prepared by the experts at Mathematical Sciences Publishers. Special care has been taken to make the search feature work well. Thousands of useful "clickable" cross-references are also provided – from exercises to their answers & back, from the index to the text, from the text to important tables & figures, etc.

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2.1.2 Volume 1

- *Fundamental Algorithms*, 3rd Edition (Reading, Massachusetts: Addison-Wesley, 1997), xx+650pp.

- *Volume 1 Fascicle 1*, MMIX: A RISC Computer for the New Millennium (2005), v+134pp.

Bibliography

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