Computer Science

Computer science deals with the theoretical foundations of information and computation, together with practical techniques for the implementation and application of these foundations. Computer science is the [scientific](https://en.wikipedia.org/wiki/Science) and practical approach to [computation](https://en.wikipedia.org/wiki/Computation) and its applications. It is the systematic study of the feasibility, structure, expression, and mechanization of the methodical [procedures](https://en.wikipedia.org/wiki/Procedure_(computer_science)) (or [algorithms](https://en.wikipedia.org/wiki/Algorithm)) that underlie the acquisition, representation, processing, storage, communication of, and access to [information](https://en.wikipedia.org/wiki/Information). An alternate, more succinct definition of computer science is the study of automating algorithmic processes that scale. A [computer scientist](https://en.wikipedia.org/wiki/Computer_scientist) specializes in the theory of computation and the design of computational systems.

Its fields can be divided into a variety of theoretical and [practical disciplines](https://en.wikipedia.org/wiki/Practical_disciplines). Some fields, such as [computational complexity theory](https://en.wikipedia.org/wiki/Computational_complexity_theory) (which explores the fundamental properties of [computational](https://en.wikipedia.org/wiki/Computational_problem) and intractable problems), are highly abstract, while fields such as [computer graphics](https://en.wikipedia.org/wiki/Computer_graphics_(computer_science)) emphasize real-world visual applications. Still other fields focus on challenges in implementing computation. For example, [programming language theory](https://en.wikipedia.org/wiki/Programming_language_theory) considers various approaches to the description of computation, while the study of [computer programming](https://en.wikipedia.org/wiki/Computer_programming) itself investigates various aspects of the use of [programming language](https://en.wikipedia.org/wiki/Programming_language) and [complex systems](https://en.wikipedia.org/wiki/Complex_systems). [Human–computer interaction](https://en.wikipedia.org/wiki/Human%E2%80%93computer_interaction) considers the challenges in making computers and computations useful, usable, and [universally accessible](https://en.wikipedia.org/wiki/Computer_accessibility) to [humans](https://en.wikipedia.org/wiki/Human).

History of Computer Science

The earliest foundations of what would become computer science predate the invention of the modern [digital computer](https://en.wikipedia.org/wiki/Digital_computer). Machines for calculating fixed numerical tasks such as the [abacus](https://en.wikipedia.org/wiki/Abacus) have existed since antiquity, aiding in computations such as multiplication and division. Further, [algorithms](https://en.wikipedia.org/wiki/Algorithm) for performing computations have existed since antiquity, even before the development of sophisticated computing equipment. The ancient [Sanskrit](https://en.wikipedia.org/wiki/Sanskrit) treatise Rules of the Chord, is a book of algorithms written in 800 BC for constructing geometric objects like altars using a peg and chord, an early precursor of the modern field of [computational geometry](https://en.wikipedia.org/wiki/Computational_geometry).

Areas of Computer Science

As a discipline, computer science spans a range of topics from theoretical studies of algorithms and the limits of computation to the practical issues of implementing computing systems in hardware and software. [CSAB](https://en.wikipedia.org/wiki/CSAB_(professional_organization)), formerly called Computing Sciences Accreditation Board which is made up of representatives of the [Association for Computing Machinery](https://en.wikipedia.org/wiki/Association_for_Computing_Machinery) (ACM), and the [IEEE Computer Society](https://en.wikipedia.org/wiki/IEEE_Computer_Society) (IEEE CS) identifies four areas that it considers crucial to the discipline of computer science: *theory of computation*, *algorithms and data structures*, *programming methodology and languages*, and *computer elements and architecture*. In addition to these four areas, CSAB also identifies fields such as software engineering, artificial intelligence, computer networking and communication, database systems, parallel computation, distributed computation, human–computer interaction, computer graphics, operating systems, and numerical and symbolic computation as being important areas of computer science