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Importance and Techniques of Computer Science

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Short Communication

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DESCRIPTION

Computer science is a subject of research that is commonly differentiated from computer programming. Calculation, automation and information are the three topics covered by computer science. Algorithms, the theory of computation, information theory, and automation are a few examples of theoretical fields in computer science (including the design and implementation of hardware and software).

Algorithms and data structures are important to computer science. The theory of computation is concerned with abstract computation models and broad categories of problems that can be solved using them. The disciplines of cryptography and computer security are fundamentally concerned with the study of techniques for secure communication and the avoidance of security problems.

Although it was first suggested in 1956, the term "computer science" first appeared in a 1959 Article in Communications of the ACM [1]. Louis Fein makes the case for the establishment of a Graduate school in computer sciences, similar to the establishment of Harvard business school in 1921[2]. He justifies the name by pointing out that, like management science, a subject is applied and interdisciplinary in nature while possessing the traits of an academic discipline [3]. As a result his efforts along with those of others like mathematician George Forsythe—were rewarded: starting with Purdue University in 1962, universities moved on to establish such departments [4]. Contrary to its name, computer science involves far more than only the study of computers [5]. Naur also offered an alternative statement [6]. Some people believe that computer science and mathematics are far more closely related than they are with other scientific fields, and some people even believe that computer science is a mathematical science [7]. Mathematicians like Kurt Gödel, Alan Turing, John von Neumann, Rózsa Péter, and Alonzo Church had a significant influence on early computer science, and there is still a valuable exchange of ideas between the two disciplines in areas like algebra, category theory, domain theory [8].

Theory of information and coding

Information theory, which has connections to statistics and probability, is concerned with quantifying information. This was created by Claude Shannon to discover the basic restrictions on signal processing tasks, such as data compression and reliable data storage and communication [9]. The study of codes' characteristics and suitability for a certain application is known as coding theory [10]. Codes are systems for changing information from one form to another. Data compression, cryptography, error detection, and correction, as well as more recently network coding, all require codes [11]. In order to create effective and dependable data transmission techniques, codes are investigated [12].

Formal techniques and theory of programming languages

The two main articles are formal techniques and programming language theory.

1. Computer science's branch on programming language theory is concerned with how programming languages are created, how they are used, how they are analyzed, characterized, and classified, as well as how each of their component aspects are classified. It is a branch of computer science that influences and depends on the fields of linguistics, software engineering, and mathematics. There are various specialized academic journals in this dynamic field of study.
2. For the specification, development, and verification of software and hardware systems, formal techniques are a special type of mathematically based technique. The idea that completing adequate mathematical analysis can, like in other engineering disciplines, contribute to the reliability and robustness of a design is what drives the adoption of formal methods for software and hardware design.

CONCLUSION

Database theory, which considers techniques for modeling computer operations, and programming language theory. A subject that depends on information is computer science. We would have referred to it as an experimental science, but much like in astronomy, economics, and geology, certain of its special types of observation and experience do not match a specific stereotype of the experimental method. Building a new machine is an experiment. The process of actually building the machine poses a question to nature, and we seek its response by witnessing the machine in action and evaluating it with all available analytical and measurement techniques. The link between computer science and software engineering is a difficult topic that is complicated by disagreements over the definitions of computer science and "software engineering."

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