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Communication Design and Implementation of Computers and Computer Systems

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Introduction

In the early days of computing, the ACM's communications suggested the terms turingineer, "turologist," "flow charts man," "applied meta-mathematician" and "applied epistemologist" for those who worked in the field. In the same journal three months later, comptologist was suggested, followed by hypologist the following year [1]. Additionally, the term "computics" has been proposed. informatique (French), Informatik (German), informatica (Italian, Dutch), informatica (Spanish, Portuguese), informatika (Slavic languages and Hungarian) and pliroforiki (which means informatics) in Greek are all contracted translations of the expression "automatic information" or "information and mathematics" in Europe. Similar terms have also been used in the UK, such as at the university of Edinburgh's school of informatics. However, in the United States, informatics is associated with applied computing or computing within another domain. The expression "computer science is no more about computers than astronomy is about telescopes" comes from a folkloric saying that is frequently attributed to Edsger Dijkstra but almost certainly did not originate there from. Most people think that disciplines other than computer science are responsible for the design and implementation of computers and computer systems. For instance, the study of computer hardware is typically included in the field of computer engineering, whereas the study of commercial computer systems and the implementation of those systems is frequently referred to as information technology or information systems. However, the various computer related fields have communicated their thoughts [2].

Description

Other fields of study, such as cognitive science, linguistics, mathematics, physics, biology, Earth science, statistics, philosophy and logic, frequently intersect with computer science research. Some people believe that computer science is more closely related to mathematics than many other scientific fields. Others say that computing is a mathematical science. Mathematicians like Kurt Godel, Alan turing, John von Neumann, Rozsa Peter and Alonzo Church had a significant impact on early computer science and there is still a useful exchange of ideas between the two fields in areas like mathematical logic, category theory, domain theory and algebra [3]. Disputs regarding the meaning of the term "software engineering" and the definition of "computer science" further complicate the contentious issue of how computer science and software engineering are related. According to David Parnas, who is taking a cue from the relationship that exists between various engineering and scientific fields, the primary focus of software engineering and computer science is the design of specific computations to achieve practical goals, whereas the primary focus of computer science is the study of the properties of computation in general. Computer science's academic, political and funding aspects typically depend on whether a department is set up with an engineering or mathematical focus. Departments of computer science with a numerical focus and a focus on mathematics should think about joining computational science [4]. Both kinds of departments usually try to bridge the educational field, if not all research. Despite the word "science" in its title, it is unclear whether computer science is a branch of engineering, mathematics or science. In 1975, Allen Newell and Herbert A. Simon made the argument that computer science is an empirical field. We would have referred to it as an experimental science, but, like astronomy, economics and geology, some of its distinctive methods of observation and experimentation do not conform to a strict definition of the experimental method [5]. They are nonetheless experiments. Every newly constructed machine is an experiment. The machine's actual construction raises questions for nature; in addition, we listen for the response by observing the machine in action and analyzing it using all available analytical and measurement tools [6].

Since then, it has been argued that computer science can be considered an empirical science because it uses empirical testing to determine whether programs are correct. However, it is still difficult to define computer science's laws and theorems (if any) and the nature of computer science experiments. The reliability of computational systems is investigated in the same manner as bridges in civil engineering and airplanes in aerospace engineering, according to proponents of the classification of computer science as an engineering field. Computer science, on the other hand, focuses on creating phenomena rather than observing what is already there, as opposed to the empirical sciences' observation of what is already there. In addition, they argue that, in contrast to the empirical sciences, which discover laws through observation, computer science focuses on creating phenomena. Computer scientists Edsger and Tony Hoare view instructions for computer programs as mathematical sentences and interpret formal semantics for programming languages as mathematical axiomatic systems. Proponents of classifying computer science as a mathematical discipline contend that programs can be deductively reasoned through mathematical formal methods. In computer science, a number of computer scientists have argued that there should be three distinct paradigms. According to Peter Wegner's argument, those paradigms are mathematics, science and technology. The working group led by Peter Denning argued that they are design, theory and abstraction (modeling). Computer science focuses on methods involved in the design, specification, programming, verification, implementation and testing of human-made computing systems. Amnon referred to these as the rationalist paradigm, which treats computer science as a branch of mathematics and primarily employs deductive reasoning; the technocratic paradigm, which may be found in engineering approaches, most notably in software engineering; and the "scientific paradigm," which approaches computer-related artifacts from the empirical perspective of the natural sciences and computer science covers a wide range of topics as a field, from theoretical research on algorithms and computation's limits to the practical challenges of putting computing systems into hardware and software.

Conclusion

The Computing Sciences Accreditation Board (CSAB), formerly the computing sciences accreditation board, is comprised of representatives from the IEEE Computer Society (IEEE CS) and the Association for Computing Machinery (ACM). It identifies four areas that it deems essential to the field of computer science: theory of computation, data structures and algorithms, programming languages and methods and computer parts and architecture sSoftware 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 are all important areas of computer science, according to CSAB.

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