Computer Science as a Discipline and the 5 Computing Disciplines and Majors

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In Partial Fulfillment of Portfolio No.1 for the Course CIS-1102
Introduction to Computing

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Computer Science as a Discipline

Computer science is the study of computers, computational systems and algorithms. Subsequently it is also a broad area of topic with many interrelated disciplines such as the fields: Computer Engineering, Software Engineering, and Information Systems (Denning, 1999).

History of Computer Science

Alan Turing, a British Mathematician that formalized the idea that later turned into the Turing Machine. Alan Turing's innovation of the Turing machine that carried out instructions represented as zero's and one's way back in 1936 (Tucker et al., 2025). Turing is believed to be the father of modern Computer Science for the introduction of binary incorporated into machines, paving the way for future computer systems.

Five Computing Disciplines and Majors

Computer Science is the study of computations and computer systems, with fields related to algorithm-building, data systems, and information systems. It also incorporates more on the backend processes of software, rather than designs of the frontend.

Furthermore, Computer Engineering is the discipline that focuses on the physical aspects of computers, also known as hardware. Computer Engineering is needed in order for software to come to life, and it is directly correlated with software engineering (Zimmer, et al., 2006).

Subsequently, Software Engineering is a discipline that tackles the development of usable code into everyday life, it also incorporates engineering principles together with computer science principles in maintaining websites, applications, and security systems (Johanson, 2018).

Next, Information Technology is a discipline that incorporates the use of telecommunication systems, and computers. Furthermore, this discipline goes hand in hand with computer science, incorporating programming, business management, and computer systems.

Aftermost, the Information System is a discipline of a broad area of studies, specifically it includes hardware, software, data structures, and a network of people coordinating to process, and control data, from raw facts into meaningful information. This discipline is connected with computer science in a way that logical reasoning is needed for both ends. (Madnick, 1995)

Analysis

The addition of Computer Sciences into the function of human life as a discipline—shaped the fast progress from slow mechanically-driven machines into the transition of the automatic and efficient object-oriented computers through the development of computation modeling (*Computation Modeling*, n.d.). This step in technological advancements assisted humans with the ability to operate personal computers, scientific calculators, mobile devices, and other technologically-related objects without the hassle of having to associate personal interference with the processes of computers and their computations. Subsequently, it is irrelevant to say that humanity is slowly advancing, this is in fact the opposite, as it is the era of rising artificial intelligence (AI) systems with the introduction of the new Generative Pre-trained Transformer (GPT) 5 (Cherukuri, 2024).

Furthermore, technological breakthroughs are seen in the current day and age left and right. This isn't because humans are naturally gifted with computers and the-like, but because of having to prevail in constant research, computations, discoveries, and innovations that advancements are able to find new ways to enhance everyday lives with more efficient devices, that are with ease-of-access, where—as per Costache and Enachescu (2025), promoting not just individuals who are able, but also to the unable—bearing inclusivity to the marginalized communities.

Contrary to belief, although there are cases when technological advancements have hindered the ability of us humans to logically improve, such as: excessive screen-time, lack of access to digital tools, where a study by Eze et al. (2022) expounded on a possible factor to hindering critical thinking could be the lack of access to adequate technological resources, there are still many ways to improve as a collective whole. The country could potentially heighten the implementation of laws regarding suspicious online activities, strengthen and empower the youth through responsible use of technology, and using online platforms as a means to spread awareness of the dangers of constant consumption and increased reliance on technology which could decrease digital literacy (Novikov & Kiseleva, 2024).

Ultimately, computer science as a discipline will pioneer more scientific breakthroughs in the distant future, but in the meanwhile, as a student, learning to understand the basics of data structures, computing, and algorithms will build the way I will be able to provide for the field of Computer science. It is not just mathematics, and logical reasoning that builds the foundation of computer science as a discipline, but with us humans on how we find the most efficient ways in solving problems.

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