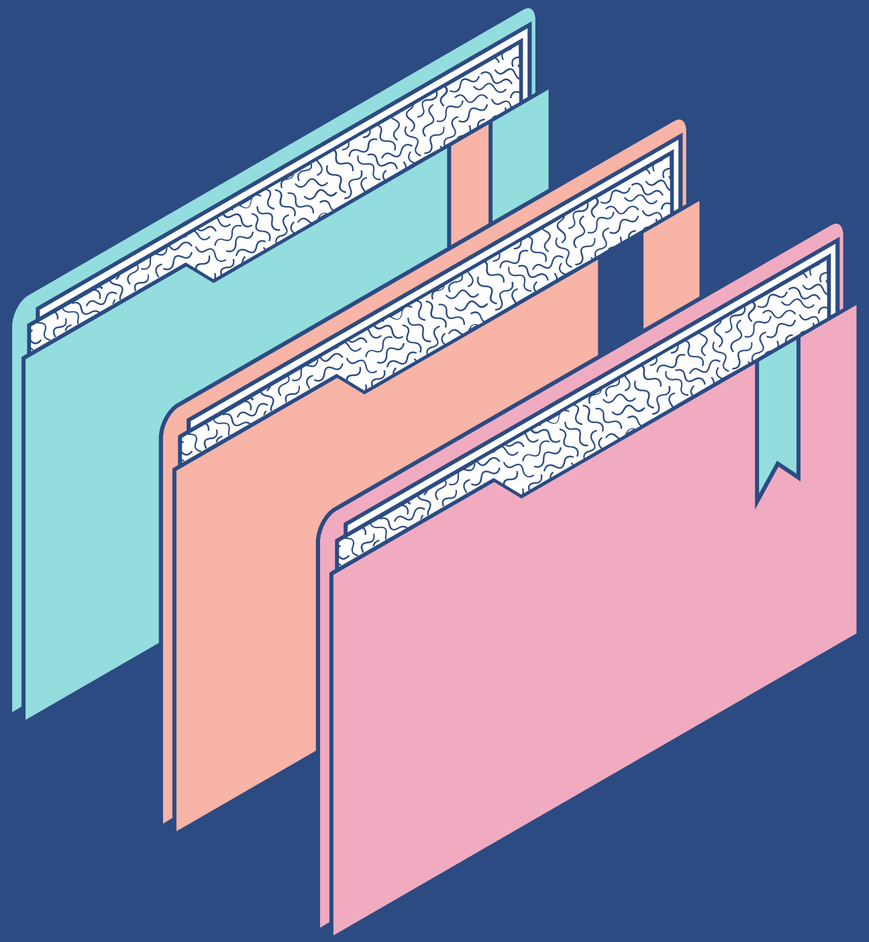
PORTOFOLIO #1

Computer Science as a discipline and majors

A look into computer science and its many disciplines



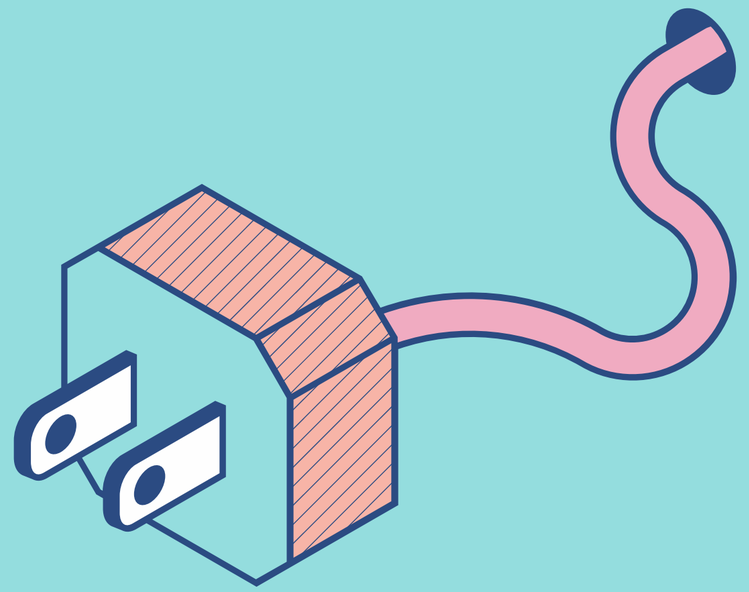
Agenda

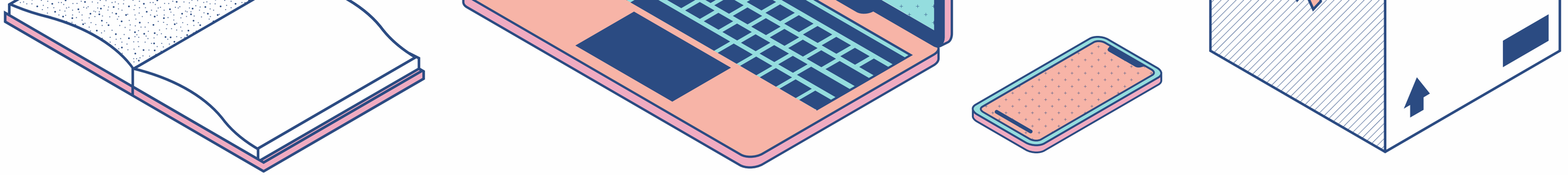
KEY TOPICS DISCUSSED IN
THIS PRESENTATION

- What is computer science
- Is it really only about programming??
- The computer science discipline
- 5 Computer science disciplines and majors

What is computer science?

Computer sciene is fairly a new field, a new species among the sciences (Loui, 1995). Computer science is the study of how information can be processed and it can be automated, represented and transformed into algorithms, data and into computer systems.





Computer Science is not only programming

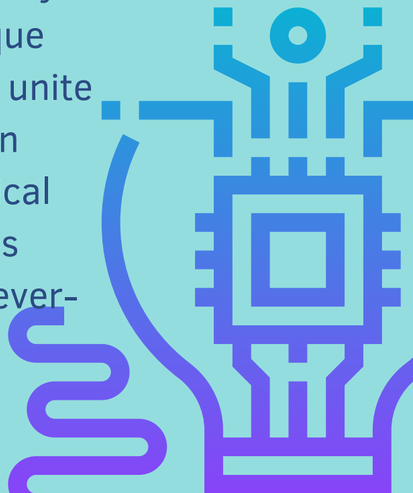
It is a common misconception that computer science is all about programming or coding; it is much more than that. The discipline has expanded so greatly. The point is that it's intertwined with many other fields. For instance, in the medical field, machines have been built, such as silicon chips that simulate body parts. In biology, biologists now view DNA as an encoding of information. Needed to generate a unique organism. Psychologists have collaborated with computer scientists on models of cognition. This shows how broad computer science has become. Computer science is not simply confined to coding and computers, but it has evolved to shape and be shaped by every other discipline.

Those in the discipline know that computer science encompasses far more than programming (Comer, 1989)

Computer science as a discipline

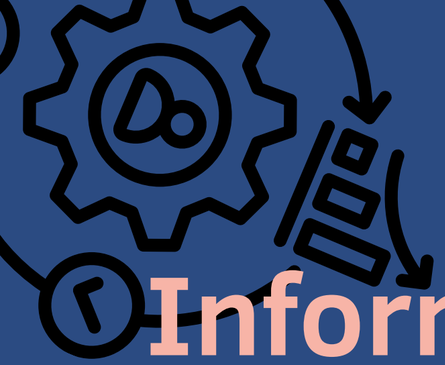
Computer science is the process where we use information and transform it into something useful; it is the systematic study of algorithmic processes that describe and transform information. It uses theories, experiments, and designs of systems to solve human problems. The discipline rests on four essential skills: algorithmic thinking, representation, programming, and design. The question to be asked about computer science is, what can we automate? And how can we do it effectively, reliably, and responsibly?

We simply cannot provide a single, fixed definition of what computer science is because it is such a broad and dynamic field. Its scope extends far beyond these foundations. The discipline has grown into an umbrella that covers many interrelated subfields, such as information technology, information systems, computer engineering, and artificial intelligence, among many others. Each of these subfields has its own unique applications and methodologies; however, they all unite on the idea of using algorithms to solve human problems. computer science is not only a technical discipline but also an interdisciplinary one This interconnectedness makes computer science an ever-evolving discipline



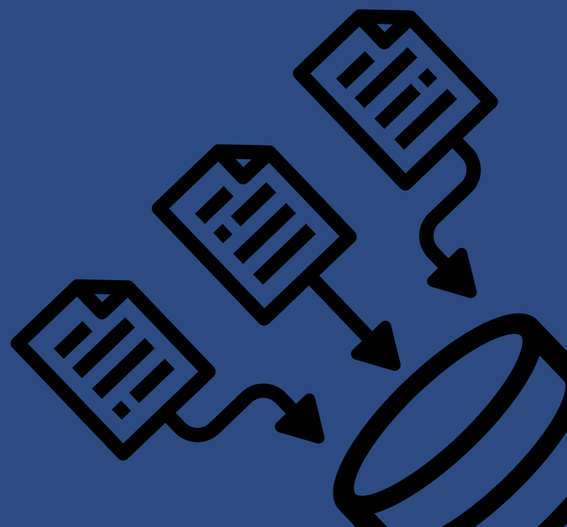
PORTOFOLIO #1

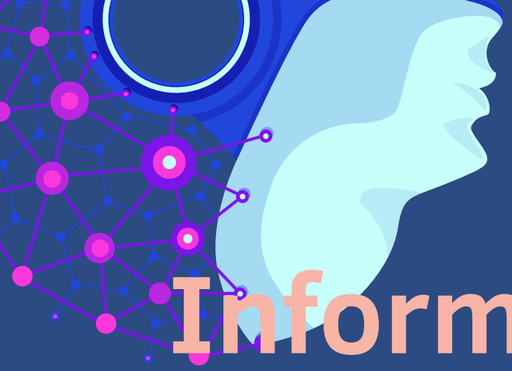
Computing Disciplines and Majors



Information system

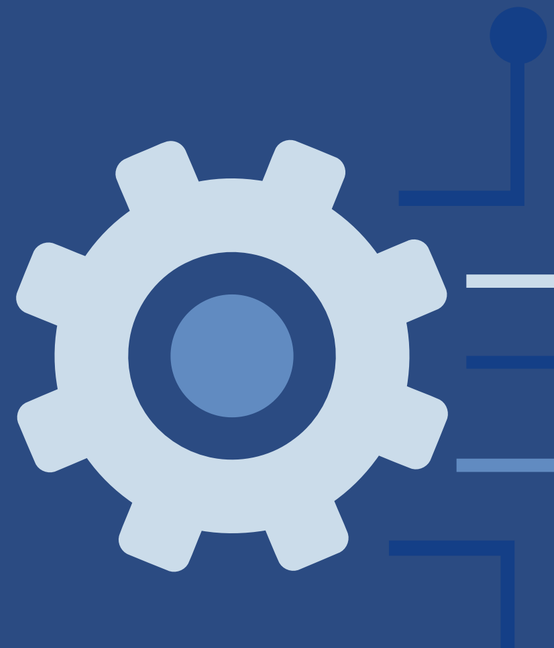
The discipline of Information Systems (IS) is concerned with the design, development, use, and impact of information and communication technologies within organizations and society. Emerging in the 1950s alongside the widespread adoption of computers for data processing, it has grown from a purely technological and data-centered field into a multidisciplinary area that integrates technology, management, organizational, and social dimensions. IS focuses not only on the technical systems themselves but also on how people and organizations interact with these technologies, investigating the social and organizational changes that result. Defined by the UK Academy for Information Systems as the study of strategic, managerial, and operational activities related to gathering, processing, storing, distributing, and using information and its technologies, the discipline is unique in its emphasis on the application of technology to solve organizational and societal challenges, making it especially vital in today’s rapidly transforming global economy .





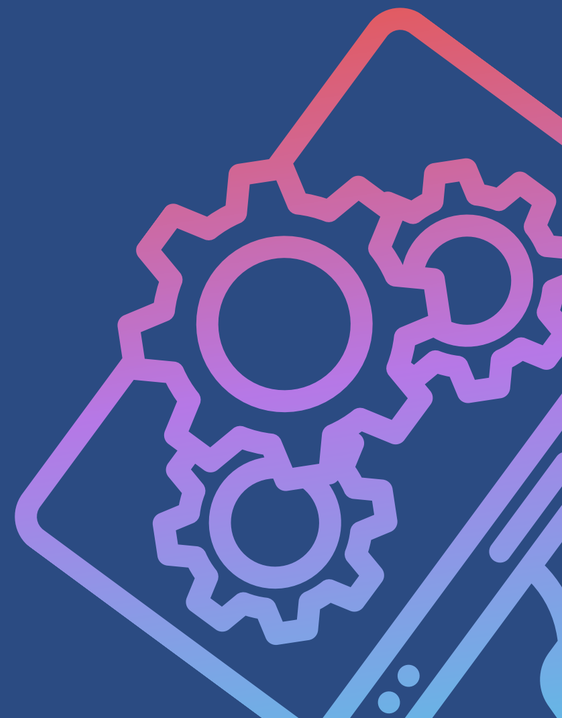
Information technology

The study of designing, managing, implementing, and securing computer-based systems to support individuals and/or organizations. It emphasizes practical skills such as system administration, networking, information security, web technologies, human-computer interaction, and system integration, ensuring that technology runs smoothly, reliably, and securely. IT professionals are trained to manage and maintain hardware and software, integrate emerging technologies, support end-users, and optimize performance in dynamic environments. As a rapidly evolving discipline shaped by industry demands, information technology continues to evolve into areas like cloud computing, virtualization, and cybersecurity, making it a vital discipline that equips specialists with the knowledge and expertise to sustain and advance the modern digital world.



Software Engineering

Software engineering is the disciplined and systematic application of engineering principles to the design, development, deployment, and maintenance of software. It transcends mere programming by establishing a rigorous framework of processes, methods, and tools to manage the immense complexity of modern software systems. This discipline encompasses the entire software lifecycle, from initial requirements gathering and analysis through design, implementation, testing, and long-term evolution. Its core aim is to construct software that is not only functionally correct but also reliable, efficient, maintainable, and delivered within predictable schedules and budgets. To achieve this, software engineering emphasizes practices such as project management, version control, rigorous testing protocols, code reviews, and architectural patterns. It is fundamentally concerned with building high-quality software at scale, ensuring that a product remains robust, secure, and adaptable to changing needs long after its initial creation, much like any other traditional engineering field.



Computer Engineering

Computer engineering integrates core principles from electrical engineering and computer science to develop and enhance computing systems. Its scope encompasses the entire technology stack, from the hardware components—such as microprocessors, embedded systems, and networking devices—to the software that drives them, including operating systems, algorithms, and system architecture. The discipline is fundamentally concerned with creating solutions that are not only functional but also efficient, reliable, and scalable. This unique intersection distinguishes it from computer science, which is more theoretical and software-oriented, and from electrical engineering, which concentrates on broader physical and power systems. Computer engineers are therefore equipped to pursue careers in a diverse range of cutting-edge fields, including microelectronics, robotics, artificial intelligence, cybersecurity, and telecommunications. Success in the field demands both adaptability in the face of rapid innovation and the ability to collaborate across disciplines, positioning computer engineering as a critical driver of progress in industries from healthcare to intelligent systems.

Data Science

Data science is an interdisciplinary field dedicated to deriving actionable insights from complex data. It synthesizes techniques from statistics, mathematics, and computer science, applying them within specific domains to inform strategic decision-making. The practice encompasses the entire data lifecycle from acquisition and cleaning to analysis, interpretation, and the communication of findings. A defining characteristic of modern data science is its strong emphasis on ethical considerations, mandating a focus on fairness, transparency, and accountability throughout the analytical process. Now established as a distinct academic and professional discipline, with its own dedicated research and curricula, data science serves as a critical bridge between raw data and practical applications, driving innovation in sectors ranging from healthcare and finance to climate science and beyond.

Reaction

Computer science isn’t all about coding and programming. As first-year computer science students, we are required to take math classes and even communication classes. Students tend to think that these classes are unnecessary and unusual. Some students still think that the computer science is solely about coding and programming; we tend to undermine the other disciplines of computer science and focus only on what we think computer science is all about: coding. Computer science is so much more than just coding or programming; there is a strong relationship between the problem-solving skills learned in mathematics and science classes and problem-solving in computer science. A good computer scientist is someone with multiple skills learned from various classes throughout the course. Communication skills, math skills, and, most especially, problem-solving skills are only a few to mention that we must acquire to become a good computer scientist. Those in the discipline know that computer science encompasses far more than programming—for example, hardware design, system architecture, designing operating system layers, structuring a database for a specific application, and validating models are all part of the discipline. Programming without these qualities is just coding, not computer science. We must incorporate all of these qualities in order to become a good and professional programmer. Just because one can code a program does not make them a computer scientist; being a computer scientist is so much more than that.

Reaction

In addition, computer science is not alone in this world of computing; it is connected with other disciplines. For example, it relies on mathematics for algorithms and logical reasoning, engineering for building hardware and networks, biology and medicine for bioinformatics and medical technologies, psychology for understanding user behavior and designing interfaces, business and economics for data-driven decision-making, and even the arts for digital media, animation, and game development. These connections make computer science an interdisciplinary field that both supports and is supported by many other areas of study. By embracing the diversity of skills and disciplines within computer science, we are not only becoming computer scientists but also problem-solvers, innovators, and contributors to the future of technology and the future of computer science.

Who im I?

Hello! I am Emilton Bontia a 1st-year computer science student in the University of San Carlos. I am 19 years old.

Why computer science? Well the most most obvious answer is the money but that boring, ever since I was a kid ive always shown interest technology and how it works and everything about, I also love playing games and wish to become a game developer/tester in the future.

I took up STEM during SHS and the technology elective so I was able to take the course CFP which had surface level C programming.

Thank you so much for listening!! :}