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Fields of Computer Science

**03**

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**Fields of Computer Science**

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**01**

## The Difference Between Theoretical and Practical Computer Science

## Like many disciplines, [computer science](https://www.uopeople.edu/blog/what-is-computer-science-all-about-your-complete-guide/) offers opportunities for both theoretical and practical work. Theoretical computer scientists focus on mathematics. Their ideas lean towards the abstract as they work to improve or create algorithms. These scientists ask themselves if the properties of specific coding benefit the application it’s tied to.

Where theoretical computer science is mathematics, practical computer science is engineering. In these fields of computer science, work is done to create better computers and hardware and software that run them. Practical computer scientists are continually designing.

The field of computer science began in the 1840s with a woman named [Ada Lovelace](https://scientificwomen.net/women/lovelace-ada-59), who wrote the algorithm for a computer machine called the Analytical Engine that up to that point had only existed on paper. Ada would undoubtedly be astonished at the number of computer science fields that people are working in today and how in the next decade almost [700,000 new jobs](https://www.bls.gov/ooh/computer-and-information-technology/home.htm" \l ":~:text=Overall employment in computer and,new jobs over the decade.) will be created.

**Fields of CS :**

* **List of Fields in Computer Science :**

### **Artificial Intelligence:**

The term [artificial intelligence (AI)](https://www.uopeople.edu/blog/artificial-intelligence-machine-learning-and-deep-learning-what-is-the-difference/) may conjure up images of those corny movies where robots take over the world but the truth is that computer scientists are creating sophisticated computers that are capable of remarkable tasks. More and more our lives are shared with AI that performs tasks like choosing music for us, processing our spoken and written languages, and completing simple and complex tasks. Computer scientists who work in AI possess strong mathematical and analytical skills and enjoy designing algorithms.

### **2. Data Structures and Algorithms:**

This is one of the fields in computer science that seeks to create better programs by studying how data structures and algorithms interact. The location where data is organized and stored is called a data structure and an algorithm is a specific set of tasks you ask the computer to undertake. The algorithm retrieves data and performs computations and it’s this interaction that computer scientists in this field study.

### 3. Computer Architecture:

Just as the title suggests, computer architects design, implement and then operate a computer system. This is one of the fields of computer science in which the architect examines how hardware works. They study how programs store data and how to best facilitate the transfer of data among connected devices.

### 4. Game Design:

We’ve come a long way from video games like Pong, Pac-Man, and Donkey Kong. What once seemed exciting and cutting edge now pales in comparison to today’s games that utilize advanced AI, seem astonishingly real, and can be played in real-time against people around the globe. Game designers utilize AI and machine learning that predicts how players advance, or not, through the game. This is one of those fields of computer science where the game designer acts as the cohesive agent between those original concept designers and the people who pick up the ball and develop the idea.

### 5. Robotics:

Robotics combines three fields of computer science – engineering, computer science, and technology – to create machines called robots. These machines are tasked with replicating or substituting human actions and robots can be found in places like the home, in industry, and in medicine to name a few.Robotics is beneficial because machines can increase productivity, reduce costs, and increase safety.

### 6. Security:

As you can imagine, [information security](https://www.uopeople.edu/blog/what-does-a-cyber-security-professional-do/) is one of the paramount concerns in computer science fields. Unfortunately, some people work to steal information – personal, industrial, medical, design, etc. The theft of this information is devastating and can have harmful and far-reaching consequences. Computer scientists who work in information security possess an impressive depth of knowledge about hackers and the tools they use to exploit security vulnerabilities. They are responsible for the security of things like software applications, personal and company data, and storage hardware.

### 7. Software Engineering

[Software engineers](https://www.uopeople.edu/blog/5-reasons-for-choosing-an-online-software-engineering-degree/)will find themselves working on both the theoretical and practical aspects of building software systems. Teamwork is vital to software engineering and involves a great deal of time and money. The work is varied and involves processes like debugging, testing security, assessing the flexibility of a program, and maintaining the applications.

02

**My Interest in specific field:**

My interest is in the field of **Data Science**. The field of **data science** is very vast in this current time. Basically **data science** is the study of data to extract meaningful insights for business.It is a multidisciplinary approach that combines principles and practices from the fields of mathematics, statistics, artificial intelligence, and computer engineering to analyze large amounts of data.

**Reason of interest:**

03

Basically my interest was in the analysis and manipulating of data, so in the future I will probably choose the data science field if an option is given, this field has a very vast scope now-a-days because in modern time it is a kind of fast emerging field and have very vast jobs.

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