Fields Report

The world of technology is rapidly advancing, experiencing advances and changes every year. Software engineering, computer science, and information technology are three fields that dominate this world and are critical to its maintenance and improvement. The three fields differ mainly in a way similar to what their names suggest. Computer scientists focus on the "science" behind the development of computers and programs. They develop a strong base in discrete mathematics, algorithms, and data management, which allows them to pursue a theoretical approach to developing new algorithms, creating efficient programs, and designing new programming languages. Computer scientists are "scientists", so they employ the scientific method to research and develop, pushing the current limitations of the industry.

Software engineers, on the other hand, are "engineers", which means they focus more on the implementation and maintenance of existing software. This includes the application of software, overseeing the entire process from idea inception to final product. As engineers, their main jobs are to create new things using existing technologies that have applications in daily life. Thus, software engineers are concerned with what is being delivered to the user, ensuring functionality, security, and safety.

Finally, information technology differs from the other disciplines in that it focuses on delivering information to the user regarding maintenance and usage of technology. Information technologists often work closely with businesses to help develop, install, and maintain networks and other technology. Information technology is also very broad and has many applications from database management, hardware support, and system and network analysis.

One of the things that is so exciting about technology and computer science is how widely it is used, and how many different fields there are that have separate niches in the industry. One such field is that of data mining. A data mining specialist or a data analyst is someone employed within a business to help analyze large amounts of data and come up with ways to improve the business' performance by assessing that data. As computer scientists, they require extensive knowledge of databases and data manipulation, which usually means experience in SQL, T-SQL, SQL Server or Oracle, NoSQL, Hadoop, VBA, Java, Python, and Perl as well as experience operating in a Linux environment.

Another extremely critical computer science field is that of cybersecurity, including the position of cryptographer/cryptanalyst. This field is required to ensure that information is secure yet also conveniently accessible. Cryptographers design security systems and determine possible weaknesses to continually improve security. Their skills are rooted deeply in mathematics and include extensive knowledge of computer architecture, data structures and algorithms, and programming languages such as C, C++, Python, and Java.

A third and extremely abundant field of computer science is that of web development. At this point, it is nearly essential for every business or organization to have their own website. Websites vary in degrees of complexity, but either way computer scientists are required to develop both front-end and back-end code to create a functional website. Most web developers have skills in HTML5, CSS, JavaScript, PHP, Python, ASP.NET, and Angular.js.

Personally, I am very interested in robotics and their applications in medicine, particularly surgery. Employing robotics and artificial intelligence in surgical technologies will allow more complex procedures, minimizing the risks of infection and complications, and significantly reducing the possibilities of human error. This interests me greatly because I love the idea of artificial intelligence and machine learning, and how these ideas can be applied to helping people. Surgeries are very high-risk and have many associated complications, and robotics and artificial intelligence can help save more lives and complete procedures that are currently impossible.