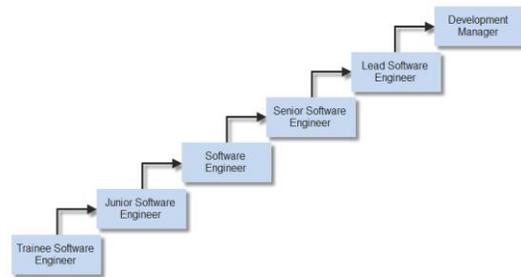


My Career Goal is to Become a Software Engineer

The STEM career that appeals to me the most is the field of software engineering. Quite frankly, I did not know what a software engineer was until I joined the robotics team and our coach showed us how to code first using VEX VR then VEX Code Blocks. I became the programmer on our robotics team this year. Since we must work remotely because of Covid-19, we decided to have only one programmer; I am that programmer! I write the code and send it to our shared google drive file and the team engineer with the robot at her house, downloads the code to the robot, and tests it over Zoom. Modifications and updates are made in the same manner.

In researching what it takes to become a software engineer, I found that it requires a bachelor’s degree and possibly a master’s degree. The field of study can vary from computer science, software engineering, or related fields. Software engineers must possess some key skills such as being analytical, having problem-solving ability, having good teamwork and communication skills, being creative, and paying attention to details.¹ I strongly feel that I possess these qualities.

The career path of a software engineer is like that of many other careers in the STEM field. The career path displayed in the image below lends itself to a solid learning experience that will help in career advancement.²



I feel as if the field of software engineering will change very drastically over the next 10 years (that is when I will be graduating college). Technology has changed so drastically in the past 10 years, I anticipate the same level of change in the coming 10 years. The table below contains a list of related career opportunities for software engineers that are projected to experience double-digit employment growth between 2012 and 2022

Careers Related to Software Engineering

Projected Job Growth³

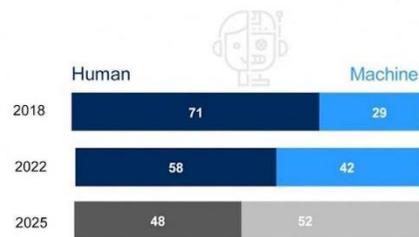
Business Information Analyst	19%
Web Developer	20%
Help Desk Support Specialist	20%
Computer Systems Analyst	25%
Information Security Analyst	37%
Database Administrator	15%

There are many, many famous males in the software engineering field such as Bill Gates, Martin Fowler, George H. Fairbanks, etc. Although I truly admire Bill Gates for all that he has accomplished and his philanthropic endeavors; I researched female software engineers and found many that may not be as well-known as Bill Gates, but are influential in their field. Elisabeth Hendrickson, for example, created R&D for both the product management and engineering for GemFire and Pivotal Cloud Cache product. She authored the book, “Explore it! Reduce Risk and Increase Confidence with Exploratory Testing”. Another female role model in software engineering is Mala Gupta who is a developer at JetBrains. She is one of the originators of eJavaGuru.com and supports Java certification. She stated in interviews that she realized that the process of getting certified made her understand all the exam topics in depth - including reasoning out, why and how the language or platform works. She accessed the Core Java API source code while trying to figure out why some of the Java API behaved in a certain way. To Mala Gupta, knowledge is power, and she continued to research and learn.⁴

The rate of growth of software engineering and related fields is tremendous in this fast-paced changing world that we are living in. As more and more repetitive tasks are becoming automated, a change in educational and career choices must follow the trend. The graph to the right depicts the increasing trend of automation versus human tasks.⁵

Rate of automation

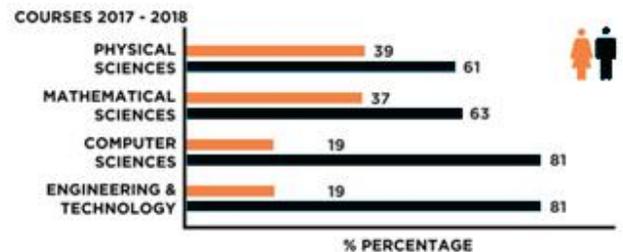
Division of labour as share of hours spent (%)



Source: Future of Jobs Report 2018, World Economic Forum

What this graph is telling us is that we need to focus on our future and be career-ready. My career choice of software engineer will prove to be a good choice as automation will need to be programmed as applications to complete specific tasks.

In researching for my career choice, I found out that software engineering and its related fields generally have more males than females. The graph to the right depicts educational paths taken by both males and females.⁶ This is all the more reason for me to want to pursue this career path. It empowers me to change the percentage in the future along with many other bright females.



As a part of my research for my career choice of a software engineer, I created a Google Form that was sent to several professionals in related fields. The survey was sent to fifty professionals in software engineering or a related field and 23 responses were received. The responses to my questions are listed in the table on the following page:

Survey Question	Responses
What is your highest level of education?	17 Bachelor's Degree 5 Master's Degree
Did you complete an internship related to software engineering?	7 yes 16 no
What was your specific field of study?	3 Computer Graphics 12 Computer Science 3 Information Technology 4 Computer Software Engineering 1 Computer Systems Analysis
What was your first job in software engineering?	3 Computer Graphic Designer 20 Computer Programmer
How long have you been a software engineer?	0-5 years 12 6-10 years 8 11-15 years 2 >15 years
What programming languages do you know?	21 Java 18 Python 15 JavaScript 23 C/C++ 16 Other
What programs do you use at work?	19 Data Base Management 17 Python 8 C/C++
What do you enjoy most about your job?	The challenge The learning The accomplishments
What do you enjoy least about your job?	The unclear client requests The length of time at a screen
What are some major changes you have seen in your profession?	Collaboration among professionals Increased level of computer sophistication Increased level of software capabilities
What would you guess is the percentage of women to men in software engineering?	3 < 10% 14 10-19% 4 20-49% 2 50% 0 >50%
Do you have any advice for students looking into entering the field?	An overwhelming response was to learn not just programming, but to learn data analysis as it relates to applications.

From the responses to the Google Form and in speaking with Software Engineers, I have learned that Software Engineering and its related fields are increasing highly in demand and the variety of industries requiring their services is continually changing and increasing. Software Engineers need to know more than programming, they need to know data analysis, data management, and database structures. As technology changes the need for Software Engineers to change and adapt increases. The jobs that will be available when I graduate college have not been created yet which shows how much the industry is changing. If you look back to where we were 10 years ago and then look ahead to where we will be in 10 years, it is mind-blowing! All students can do is study and pursue their dreams and eventually, it will all fall into place. Robotics/engineering is undoubtedly the future as technology is constantly evolving over the years.

Engineering and technology in general will be much of a bigger industry in the next 10 years. If you compare it to 2010 to present (2020) you can see how much technology has evolved. This inspires me to become a software engineer due to the predicted boom in technology and engineering jobs by the time I am in college. We think that the technology that we have right now is great and cutting edge, brand new (just like we did 5 years ago) but the truth is it is constantly evolving and stepping up. In five years from now (2025), we will think of the technology we have right now as basic and obsolete. For example, Apple releases new iPhones and devices every year (most likely in autumn) and whenever they come out as brand new the public always thinks that this is it. This is the highest technology has ever been and will be. But that is false, as it is always stepping up on their models and software.

To conclude, Software engineering is an interesting and great field for me and many other intelligent people in the future. I know for a fact that it will have such a boom in the next ten years so we will definitely find an enterprising job after college. As I look toward my future I will be looking to attend a university that has an excellent program in software engineering to help me reach my career goals. Having fun while also working on something is such an incredible anomaly that not many people are able to do. I look forward to the future to see what it holds for this field and many others.

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¹ “Glossary of Career Education Programs/Engineering, *How to Become a Software Engineer: Education & Career Requirements*,
study.com/articles/Become_a_Computer_Software_Engineer_Education_and_Career_Roadmap.html

² Fischer, Sarah. 2016. *Career Path for Developers*

<https://www.codefellows.org/blog/what-success-developer-looks-like/>

[This is a typical career path for a software developer]

³ “Software Engineering Degrees & Careers”, *Learn How to Become*, learnhowtobecome.org/computer-careers/software-engineering/

⁴ Ekaterina Novoseltseva, “25 Influential Women in Software Development”, August 15, 2019,
apiumhub.com/tech-blog-barcelona/women-in-software-development/

⁵ Chowdhry, Amit. 2018. *Rate of Automation*

<https://www.google.com/search?q=graph+software+engineering+job+growth+2020-2030>

[Division of labor as shared hours spent]

⁶ Davies, Katie. 2019. *Women in STEM* <https://www.stemwomen.co.uk/blog/2019/09/women-in-stem-percentages-of-women-in-stem-statistics>

[Percentage of women in STEM statistics]