_Career Readiness Online Challenge

Tea, Tia

#7833A

Falcon Force

Las Vegas, Windmill

Have you ever stopped amidst glancing at a mechanism and wondered, "How did someone come up with this?" Especially when the observer is always searching for new ideas, this questioning is frequent in our daily lives. However, the key to completing a creation varies from occupation to occupation. For example, software engineers focus on making an efficient product for the hardware, while students participating in VEX Robotics create the software and hardware.

The profession "software engineer" was chosen because we knew someone with first-hand knowledge of the career, my dad. Our team is filled with gamers and some of us have always been inspired by coding, which led to this decision. Although robotics engineers and software developers have their differences, such as their main objectives, they share similarities as well, including the programming aspects.

A designing process is commonly modified to suit the engineer's specialties or the client's needs. For instance, contrary to hardware engineers, software engineers rarely manage physical products. Rather, software developers focus on creating websites, apps, blockchains, or anything that requires only a processor. According to my dad, a software engineer's process typically begins with a quick sketch. There are more artistic factors in software development than you may think. From colors to animation, making sure a product looks appealing to not just the creator, but the many viewers can be difficult. After setting a base for the design, the basic architecture can be drawn. This allows room for testing code, right before adding the small
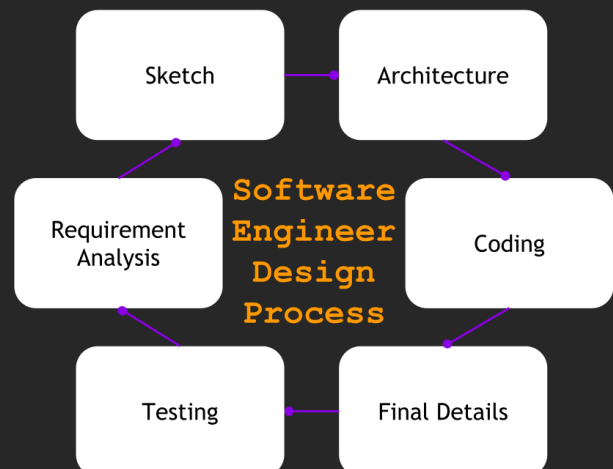
design details for a complete product. This process of design, implementation, and testing, as stated by MaRS, is named the "Waterfall Methodology." Software engineers generally focus on simpleness, presentation, accessibility, and optimization. Coding is typically less time-consuming compared to designing because while a program can either work or not, aesthetics can be interchangeable depending on the person.

Similar to the Waterfall methodology, development in robotics requires a certain order of steps to be followed. In VEX Robotics, our team typically follows the vague process of sketching an idea, building, experimenting, and lastly, programming the robot according to the challenge. We focus and first struggle on the physical build to make sure we can add code that supports the latest attributes. Likewise, software engineers attempt to complete the difficult factors at first, making sure the steps can be done and accessed before moving on. However, unlike software engineers, robotics engineers have to take the weight, outside obstacles, and physics into account for a successful build. Of course, a software engineer's designing procedure would be created in a 2D space, while a robotics engineer would mostly build using physical pieces.
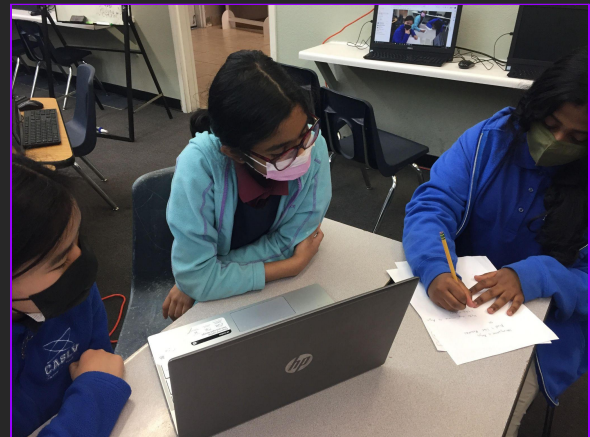
Although a robotics developer and software developers' constructing processes have clear factors that distinguish them apart, the two programming procedures are very similar. The code in both fields focuses on an input from the user

to produce an output. Whether it is clicking a button in a game or moving the knob of a robot controller forward, the program processes it and acts accordingly. Yet, according to David Grossman, who dealt with robotics research and AI at IBM Research, a crucial difference between software and robotics engineering is debugging. When programming on a software, there are no outside disruptions that cause the program to play inconsistent bugs every time the code is run. However, when a code is tested on a robot, a different outcome could occur for different test runs. A solution to this may be to program the sensors on the robot so it knows a bit more of its surroundings.

VEX Robotics prepares us for our future careers by allowing students to take control of their projects and work together as a team. This program gives us the base of what we need to get started while still allowing students to get creative and messy with their own work. STEM is the base of many careers such as architects, researchers, pilots, programmers, engineers, and much more. So many helpful aspects run VEX Robotics with not just driving or coding, but with leadership, cooperation, and competitiveness, too. There is no doubt that these qualities are present in many careers in which the students will one day participate. Robotics and other STEM activities at a young age can widen a student's dreams and potential, giving us an upper-hand in the world and a memorable experience.

Special Credits

"Product Development: Waterfall Model | Software Development
    Methodology | Entrepreneur's Toolkit." *MaRS Startup
    Toolkit*, 7 Aug. 2019,
    learn.marsdd.com/article/product-development-the-waterfa
    ll-methodology-model-in-software-development/. Accessed
    1 Jan. 2022.

"How Does Programming for Robotics Differ from Programming
    in General?" *Quora*, 2021,
    www.quora.com/How-does-programming-for-robotics-differ-f
    rom-programming-in-general. Accessed 2 Jan. 2022.

My dad, interviewee

Falcon Force, supermodels

Thanks for reading