What X’s specialty was: *E*

How X learned his specialty: *E*

Contributions to CS: *E*

Technical background: *E*

X’s personality: *E*

Tells an interesting story: *E*

Writing mechanics: *E*

*E* Excellent

*G* Good

*MN* More Needed

*M* Missing

*W* Weak

Very interesting and well researched paper! I learned a lot from it.

Ivan Sutherland: The Father of Computer Graphics

Sagar Dighe

2016. It’s hard to imagine not listening to music, checking Twitter, or Google searching something for an entire day. The bottom line is, the life of an average North American revolves around technology. All around us are screens, computers, and all kinds of buildings, cars, and gadgets that were designed using computers. For many, being surrounded by technology is the norm, some not even remembering a time without it. It’s easy to take for granted the years of work and research it took for humanity to reach this point, and unfortunately, many of the people who brought us here are not as well-known as they should be. One such individual, widely known as the “father of computer graphics”, is a perfect example of this. Without Ivan Sutherland’s revolutionary work in computer graphics and programming, we would certainly not be where we are today.

Ivan Sutherland was born May 16th, 1938 in Hastings, Nebraska. With an engineer and a teacher for parents, Sutherland was in a learning environment ever since his birth. At just 12 years old, he was able to create a program that allowed the SIMON relay-based computer to divide. SIMON was on loan to the Sutherlands by its creator, Edmund Berkeley. Despite this being his first experience with computer programming, and despite him having to physically alter the computer in order for the program to run, Ivan was able to write this division code; the longest program ever written for SIMON. He had found his passion, which would eventually lead to him becoming one of the greatest contributors to and pioneers of computer graphics. Sutherland credits his interest and success in computer graphics to his visual way of thinking, stating that, “If I can picture possible solutions, I have a much better chance of finding the right one.” In 2006, Sutherland married Marly Roncken, and they founded the Asynchronous Research Center, where he continues to lead research in computer science, even at the age of 78.

Ivan has strong views on computer science, specifically that people should do computer science for the fun of it, and nothing else. He stated, "When denied my minimum daily adult dose of technology, I get grouchy… without the fun, none of us would go on.” He also believes strongly in the power teaching: “Knowledge is a rare thing -- you gain by giving it away.”

He eventually followed his father’s engineering footsteps, graduating with a bachelor’s degree in electrical engineering, a master’s degree in electrical engineering from the California Institute of Technology, and also, a Ph. D in electrical engineering from the Massachusetts Institute of Technology. In fact, his doctorate from MIT is what gained him his famous nickname, “the father of computer graphics.”. His dissertation, “Sketchpad: A Man-Machine Graphical Communication System” described his own creation, Sketchpad. This revolutionary program served to be the basis for much of today’s human-computer interaction, a huge part of our everyday world. Back before smartphones and laptops, there was a computer called the Lincoln TX-2. Worlds apart from modern computers, the TX-2 was not exactly packed with features. However, all Sutherland needed was a CRT screen and a light pen (the predecessor to the mouse), which the TX-2 could indeed provide him.

Sketchpad was as Sutherland put it, a “graphical communication system.” Considered the ancestor of modern computer-aided design (CAD) software, it allowed the user to design objects using the light pen to guide the cursor, and the keyboard for commands such as “move”, “scale”, “rotate”, etc. It could serve to make technical drawings, or to simply be used as a sketchpad, as name suggests. It also introduced many features still found in 2D and 3D design software today, such as vertex-snapping, “objects” (which also led to object-oriented programming), and “parent/child” object relationships. Much of what we have today was designed using computer-aided design software, and so all of that technology can be traced back to Sutherland’s groundbreaking program.

Sketchpad was not however, the only significant contribution to computer science that he made. Created in 1968 by Sutherland and his then student, Bob Sproull, The Sword of Damocles was the very first virtual reality headset. In today’s terms, The Sword of Damocles was rather primitive. In fact, the headset was, much like many of the computers at the time, extremely large and heavy. It had to be suspended from the ceiling in the lab so as not to crush the person using it. h. As such, it was named The Sword of Damocles, the fabled weapon that hung above the King’s throne in Greek mythology. The software associated with this headset included primitive, wireframe 3D environments, and was also capable of head and eye tracking. This headset paved the way for recent, well-known developments in technology such as Google Glass, Oculus Rift, HTC Vive, and many others. Virtual/augmented reality has come extremely far in the last 5 years, but it all started with Ivan Sutherland and Bob Sproull, back in 1968.

In closing, much of the technology we have today was in part, a direct result of the revolutionary work Ivan Sutherland did in the 1960s. Programs with graphical user interfaces, computer-aided design software, object-oriented programming languages, virtual/augmented reality technology and the field of human-computer interaction owe their existence at least in part to Sutherland. Without him, our technology-filled world as we know it today would be vastly different. His contribution to our ongoing quest for scientific knowledge and its applications was incredibly important, and will be remembered forever.

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