Software Engineer : John Carmack
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Introduction

John D. Carmack II is an American computer programmer, video game developer and engineer. He co-founded the video game company id Software and was the lead programmer of its games Commander Keen, Wolfenstein 3D, Doom, Quake, and their sequels. Carmack pushed the standard for game development during the 1990's by incorporating innovations in 3D computer graphics such as his Carmack's Reverse algorithm for shadow volumes. In 2013, he resigned from id to work full-time at Oculus VR, where he served as CTO and later Consulting CTO in 2019.

Early Life

John took to computers early in life. An interesting tale from his youth was when John and a few accomplices broke into a local school to try to steal Apple computers. John concocted a mix of thermite and glue which melted through the windows to gain entry, however one of the group struggled and set off the alarm. The police arrived and John was sentenced to a year in juvenile prison.

His career started when Softdisk, a computer company in Shreveport, Louisiana, hired Carmack to work on Softdisk G-S which was a collection of games for early models of the Apple PC. This team was, in my opinion, on the forefront of the game market at the time as they experimented with new marking and design tactics. Carmack, with his valuable knowledge of the game software market, left softdisk to co-found id Software.

Contributions, both in approach and in practise, to the industry

Id Software was were Carmack created a lane of his own as he pioneered the use of many techniques in computer graphics, including adaptive tile refresh for Commander Keen, ray casting for Hovertank 3-D, Catacomb 3-D, and Wolfenstein 3-D, binary space partitioning which Doom became the first game to use, surface caching which he invented for Quake, Carmack's Reverse Algorithm which he devised for Doom 3, and MegaTexture technology, first used in Enemy Territory: Quake Wars. Carmack's engines were also licensed for use in other influential first-person shooters such as Half-Life, Call of Duty and Medal of Honor. In 2001 Carmack was awarded for his community contribution for the Quake 3 engine which was used by a further 12 games. Carmack was an avid open-source developer, and made sure the game engines which he helped create were published freely. Feedback on his unique style of code was described as a C++ subset close to "C with Classes" which flows down the brain with little resistance using no exceptions, no references (use pointers), minimal usage of templates, constants everywhere, classes, polymorphism and inheritance. Computer processing power was extremely limited during this period which several handicapped what could be done. You can't even compare games developed during the 1990s to modern games. However we have to appreciate that developers had to pioneer new approaches that

created better looking games all while battling the severely restricted computational power that was on offer back then. Carmack talks about this issue, saying that “When I started, computers couldn't do much more than simple arithmetic and if statements”. His attitude of “getting on with it” and using finely tuned efficiency is something that we should never forget as engineers. His approach to learning is very insightful, saying “Get more books from the library that cover beginning programming to go with the ones you have, sometimes a different author explaining the same thing will help a concept click. Go through all of them at least twice. Try to do every problem and exercise, don't just read them and think you get it. Lots of people that want to program will talk a lot about programming, but not actually write that many programs. You should write hundreds of programs”. You have to admire lifelong learners. People like Carmack who build their own knowledge base. I also personally think his attitude towards development is something that should be taught in intro to programming courses. For someone who has dedicated his life towards one industry. Carmack says “Don't expect it to be easy, you will have to work with it. If you want to get good at something you need to focus on it, which means choosing to exclude some other things from your life. Keep a little journal of what you are working on each day, you may find that you aren't applying yourself all that hard”.

It's pretty clear that carmacks work revolutionized the world of game software. As a computer science student, our perspective on software is completely void of game software experience and conventions. However you can still appreciate the work that this man has put into molding an industry into what it is today. He sacrificed and put in the basement hours so he could grow into the expert he is today.

Open source contributions

Carmack is a well-known advocate of open-source software, and has repeatedly voiced his opposition to software patents, equating them to robbery.He has also contributed to open source projects, such as starting the initial port of the X Window System to Mac OS X Server and working to improve the OpenGL drivers for Linux through the Utah GLX project.

Carmack released the source code for Wolfenstein 3D in 1995 and the Doom source code in 1997. When the source code to Quake was leaked and circulated among the Quake community underground in 1996, a programmer unaffiliated with id Software used it to port Quake to Linux, and subsequently sent the patches to Carmack. Instead of pursuing legal action, id Software, at Carmack's behest, used the patches as the foundation for a company-sanctioned Linux port.id Software has since publicly released the source code to Quake, Quake 2, Quake 3 and lastly Doom 3. His push for making an open market where people could compete with each other not through patents and legal bindings but through quality and reputation is extremely admirable and something that up and coming developers should be educated on. It's easy to see the damage that protective patents can have on the development of industries so it's motivating to know

that someone like carmack who had so much invested in his work would openly publish his work for others to use.

Work in VR

From 2013 till 2019 Carmack had pursued his lifelong goal of developing VR and AR gaming. He helped promote the Oculus Rift when it launched on Kickstarter in 2012, and he joined Oculus in 2013 as their CTO. On November 22, 2013, he resigned from id Software to work full-time at Oculus VR. Carmack can be quoted as far back as 17 years ago saying he wants to pursue VR gaming development. In the 2015 game developers convention Carmack gave a speech where he said “We are on the brink of a new era, mobile VR”. However it seems that Carmack isn't satisfied with the state of VR development at the moment. He says “he's not 'satisfied with the pace of progress” and acknowledged that VR itself remains very niche. Carmack's most notable contribution in the VR world, even though there are plenty, was his contribution to building the Gear VR, a phone-powered VR headset that was released before the consumer Oculus Rift and remains one of the most widely distributed headsets ever created.

Future Endeavours

Carmack now plans on focusing his time on artificial general intelligence. He will remain in a “consulting CTO” position at Oculus, where he will “still have a voice” in the development work at the company.