A Biography of John Carmack

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John Carmack is an American software engineer and video game developer. He is seen by many as one of the most influential people in computer game development of all time, including Time magazine, who placed him at number 10 in their 1999 list of the 50 most influential people in technology.[1] Although he is known for developing and directing the development of iconic first-person shooter games including *Doom*, *Quake, Wolfenstein 3D* and *Rage,* his innovations in software engineering, particularly in 3D Graphics, are the reason he has achieved such recognition in the field.

Carmack was born in Kansas City, Missouri in 1970 and had acquired an interest in gaming from a young age, being exposed to arcade games including *Space Invaders* and *Pac-Man*. After attempting to steal some Apple II computers from a school at the age of 14 using thermite and vaseline, he was sentenced to a year in a juvenile home. On psychiatric evaluation he was described as “a brain on legs”.[1] Carmack described his youth in the following quote:

"I was sort of an amoral little jerk when I was young. I was arrogant about being smarter than other people, but unhappy that I wasn't able to spend all my time doing what I wanted." (“John Carmack Answers”, Slashdot 1999)

After his release, Carmack attended Computer Science classes at the University of Missouri for a few semesters but dropped out to become a full-time freelance programmer. However he soon realised that contract programming was not enough to make money and was convinced to attend an interview for the software publishing company, Softdisk, in Louisiana. There, he met John Romero and many other sharp programmers, who impressed Carmack as they had more experience than him. This intrigued Carmack into accepting the job offer at Softdisk. In 1990, Carmack famously came up with ‘adaptive tile refresh’ for the *Commander Keen* PC game he created along with Romero, Tom Hall and Adrian Carmack. This technique allowed PC’s to mimic the smooth side scrolling effect of many console games and to compensate for poor graphics performance.[2] After the success of the game they created, which was published by Apogee Software, the team left Softdisk and founded id Software in 1991.

The same year they released *Hovertank 3D*, in which Carmack employed a technique called ray-casting, an algorithm used for rendering only the area of a level that the player could see, as opposed to the entire level. This allowed for more detailed graphics due to conservation of processing power. This was also used in *Wolfenstein 3D,* which was released a year later, and this game led to the growth in popularity of

the first-person shooter genre. This was followed up by *Doom* in 1993, which was powered by Carmack's *Doom* engine, also known as id Tech 1. *Doom* was one of the most popular games at the time, and Carmack had made parts of its source code public, which allowed players to create modifications in graphics and levels. This popular practice known as 'modding' contributed to the popularity of Carmacks games as it created a community of people sharing and building mods together.

Doom was also the first game to use binary space partitioning, which allows spatial information to be kept about objects in a players field of view and accessed quickly. Carmack also pioneered the technique of surface caching for the game *Quake* as part of his *Quake* Engine. This engine allowed the 3D environment of games to be pre-rendered and improved overall performance and speed. The Quake Engine was also licensed for use in well-known games such as *Half-life* and *Call-of-Duty*. *Quake* also was the first first-person shooter that properly incorporated multiplayer gaming over the internet with *Quakeworld*, which was a huge step towards what gaming is today.

The source code for *Quake* was actually leaked, and a programmer used it to port the game to the Linux operating system. This unknown programmer sent the patches to Carmack himself, and instead of taking legal action against the programmer, id Software used them and completed an official Linux port themselves. Carmack is an advocate of open-source software. He confirmed on twitter himself that he once said,

"*Programming is not a zero-sum game. Teaching something to a fellow programmer doesn't take it away from you. I'm happy to share what I can, because I'm in it for the love of programming*."[6]

id then released the source code to *Quake 2, Quake 3* and *Doom 3.* The id Tech 4 engine, or the "Doom 3 Engine", was also released as open source. Carmack is of the firm belief that software patents are basically "mugging someone".[7]He once argued that a team of programmers could work together on a problem and they could all end up devising solutions that would be patentable. As a result they could be similar enough that whoever filed the patent first could sue the rest. He sees no benefit in this, and stated that he would have no part in it.

The second sequel to *Doom, Doom 3,* popularised the use of shadow volume. Carmack came up with his own variation of adding shadows to a rendered 3D scene, known as Carmack's Reverse, which uses a stencil buffer implementation. He independently came up with the algorithm in 2000 while developing *Doom 3*. Carmack developed the game engine id Tech 4 for this game also. He also created the id Tech 5 engine, which was used first for *Rage (2007)* and then *Wolfenstein: The New Order (2014).* All of these games are seen by the gaming community as those

that set the standard for first-person shooter games and resulted in the genre being one of the most popular across PC and console.

In 2013, Carmack joined Oculus VR, a company specialising in Virtual Reality, and decided to leave id Software after working with them for over 20 years. He had always had an interest in virtual reality, but unfortunately could not pursue his interest at id Software. The reason for this was due to ZeniMax Media, the parent company of id Software, not wanting to support the Oculus Rift, a VR headset developed by Oculus. He tweeted after leaving id,

"I wanted to remain a technical adviser for Id, but it just didn't work out. Probably for the best, as the divided focus was challenging."[3]

Later on, Carmack's involvement with the two companies led to a lawsuit by ZeniMax against Oculus, where they claimed Oculus stole their VR intellectual property. This lawsuit was later resolved. Carmack took on the role of Chief Technical Officer at Oculus when he left id and remains in this position today, keeping his admirers updated via his Twitter.

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