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STS 2500

Scientist, Educator, and CG Pioneer: Dr. James (Jim) Blinn

Three years after its conception, the computer science department at the University of Utah successfully procured the talent of Ivan Sutherland, a Harvard professor renowned for his contributions to the emerging field of computer graphics. David Evans (then chairman of the computer science department) persuaded a reluctant Sutherland to join him at the University of Utah on the condition that he help start a company with him: Evans and Sutherland.[1] From an outsider's perspective, this compromise proved to be worth it as the duo created, inarguably, the most influential partnership in the development of computer graphics since 1968. The Evans and Sutherland partnership, the University of Utah, and generous government funding created an environment conducive to great research and talent development. In fact, author Robert Rivlin famously quotes in his book *The Algorithmic Image: Graphic Visions of the Computer Age*,

"Almost every influential person in the modern computer-graphics community either passed through the University of Utah or came into contact with it in some way."

In addition to Evans and Sutherland, Rivlin refers to Ed Catmull, Henri Gouraud, Bui Tuong-Phong, Martin Newell, Jim Blinn, and many more familiar names in the computer graphics community. Jim Blinn, in particular, deserves recognition among these pioneers for his commendable work in research, industry, and academia. Jim's interests were intellectual, yet practical, and Jim had a unique character that was admired by everyone he met.

Jim Blinn studied physics and communications science for his undergraduate education at the University of Michigan and received his degrees in the year of 1970. He went on to complete

[1] Seymour, Mike. (2012, July 24). Founders Series: Industry Legend Jim Blinn. Retrieved March 12, 2017, from https://www.fxguide.com/featured/founders-series-industry-legend-jim-blinn/

seven years of computer graphics research while working on his master's degree in engineering at Michigan before computer science was even offered as a degree subject. After completing his master's in engineering, Jim left Michigan for Utah to complete his Ph.D. in computer science by the year 1978.[2] While doing his graduate work there, Jim made significant contributions to the field of computer graphics through his research. One of his most notable contributions was environment mapping; although, Blinn himself admits that it was his thesis advisor, Martin Newell, who came up with the idea. Blinn's own research into applying texture to flat surfaces via Newell's algorithm (bump mapping) changed the course of computer graphics; Blinn's research afforded other computer graphic artists the ability to create computer-generated scenes with unprecedented realism.

Jim's research at Utah was exceptional in that it changed the way virtual objects appeared on the computer screen; however, this work was just the beginning of Blinn's distinguished career in computer graphics. Perhaps due to his background in physics, Blinn's true interest was space exploration, which led him to leave Utah and join Ivan Sutherland at Caltech. While there, Blinn both taught courses at Caltech and did work for the Jet Propulsion Laboratory. Some of Blinn's most recognized work is the work he did for the NASA Voyager missions at JPL. Blinn decided, without instruction, to create computer-generated flyby simulations of the space missions, and these flyby simulations were the first exposure that most of the general public had to any computer-generated simulation of its type.[3] Blinn's willingness to attempt a risky project, and to ultimately succeed in doing so, earned him a lot of respect at JPL.

[2] Blinn, Jim. JBWC - Biography. Retrieved March 13, 2017, from http://www.jimblinn.com/biography/

[3] Sito, Tom. (2015). Moving Innovation: A History of Computer Animation. Cambridge, MA: The MIT Press.

Jim's research at the University of Utah earned him immediate respect amongst the more successful elites of the computer graphics community, but his work at JPL was what made him famous. Interestingly, the original film that Blinn created was lost by the department of public information, so Blinn had to create another version before it was sent out. The film may have never been publicly available were it not for Jim's enthusiasm for the work and his willingness to put in many hours of effort to recreate the entire film.

In everything that Jim pursued, he was successful at. It started to seem as if Jim could be successful both as a researcher and an industry leader; however, Jim prioritized his passion for learning and helping others to learn over everything. This passion led to his involvement in creating nearly eight hours of computer-generated imagery in the *The Mechanical Universe*, a 52 episode series that taught university level physics to undergraduates at Caltech. This project suited Jim perfectly as it incorporated both his love for the physical universe and computer graphics. In Jim's own words, "It was the project I was born to do."[4] Jim's involvement in this project took up a lot of time, and it was no easy task to create nearly eight hours of computer-animated film in 1985. In addition to The Mechanical Universe, Blinn also worked on *Carl Sagan's Cosmos: A Personal Voyage* and *Project MATHEMATICS!* [5]

Blinn's consistent dedication to using his own talents to help disseminate scientific knowledge shows his true character and his passion for education. Although Blinn's research at Utah, work for JPL, and teaching at Caltech were all remarkable achievements, Blinn's attitude toward life and his resilient character is what really made him one to admire. Blinn persevered

[4] Seymour, Mike. (2012, July 24). Founders Series: Industry Legend Jim Blinn. Retrieved March 12, 2017, from https://www.fxguide.com/featured/founders-series-industry-legend-jim-blinn/

[5] Blinn, Jim. JBWC - Biography. Retrieved March 13, 2017, from http://www.jimblinn.com/biography/

through multiple technical challenges at JPL and always viewed the world through a curious lens. Although Jim's contributions helped many others to become involved in computer graphics, Ivan Sutherland's famous comment that, "there are about a dozen great computer graphics people and Jim Blinn is six of them," further emphasizes his grandeur and importance in the computer graphics community.[6] There is a well-known story about John Lasseter meeting Jim Blinn after showing Luxo Jr. at SIGGRAPH. Essentially, Lasseter notices Jim Blinn approaching him from afar, and Lasseter frantically looks around the room for a technical expert to help him in answering any questions Jim may have about the feature film. Instead, and much to John's surprise, Jim simply asks, "was it a mother lamp or a father lamp?" His interest in John's intellectual work rather than his technical work shows how Jim was always putting people before technology, which helped him better relate to the people he encountered. Blinn's enthusiasm for the technology he developed and his passion for teaching allowed him to influence many people during his incredibly successful career. Jim's work made him a pioneer in computer graphics, but his disposition is what made him memorable as an individual.

On my honor as a student, I have neither given nor received unauthorized aid on this assignment.

[6] Seymour, Mike. (2012, July 24). Founders Series: Industry Legend Jim Blinn. Retrieved March 12, 2017, from https://www.fxguide.com/featured/founders-series-industry-legend-jim-blinn/