



Electrical Engineering Department
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TCE GUEST TALK

Rob Cook

Vice President of Advanced Technology, Pixar

Monday, January 11th, 2015
11:30 - CS Taub building, room 337

Host: Prof. Adam Shwartz

Cartoon Physics



Abstract

Pixar's animated films are created using computer graphics, so the characters are constructed and animated in a virtual 3D world. Manipulating that world involves using physics and math for everything from sculpting the shapes of objects to animating the characters to lighting the scenes to texturing the surfaces to simulating the motion of clothes and hair. And although cartoon physics is based on classical physics, it has to adapt to the wacky things animators do. It has to be responsive to artistic control and do things that aren't physically possible while still looking physically plausible.

Bio

Rob Cook was the co-architect and primary author of Pixar's RenderMan software, which creates photo-realistic computer images. In 2001, he and two colleagues received Oscars for their contributions, the first ever given for software. RenderMan was used for 23 of the last 25 films to win a Visual Effects Academy Award. He has a BS in physics from Duke University and a MS in computer science from Cornell University. At Cornell, he worked on simulating realistic surfaces, taking computer-generated images beyond the limited plastic look they had at the time. In 1981, he joined Lucasfilm/Pixar, where he developed the first programmable shader; programmable shading is now an essential part of GPUs and game engines as well as high-end renderers. He was the first to use Monte Carlo techniques in computer graphics, which was essential for simulation of complex, realistic lights and camera effects. The latter proved particularly important in the special effects industry, because it allowed computer-generated imagery to match the motion blur and depth of field of the live-action footage with which it was combined. In 1987, he received the ACM SIGGRAPH Computer Graphics Achievement Award in recognition of these contributions, and in 2009, he received the ACM SIGGRAPH Stephen A. Coons Award for his lifetime contributions to the field. In 1999, he was inducted as a Fellow of the Association for Computing Machinery. He is one of only two people ever named to both the Academy of Motion Picture Arts and Sciences and the National Academy of Engineering.





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Computer
Science
Department

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18:00 - CS Taub building, room 337

Host: Prof. Adam Shwartz

Creative Teams



Abstract

Making a Pixar movie involves a team of hundreds of people from widely different disciplines using a lot of sophisticated technology. The scale and complexity of the process make it challenging to create a cohesive story that audiences find moving. This talk looks at how Pixar addresses that challenge. The principles involved are pertinent to any creative endeavor that involves large teams and sophisticated technology, but the visual and emotional nature of movies makes those principles particularly evident and clear.

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