



# Adding Depth

The substantial use of digital technology in films has landed mathematics a leading role (mostly uncredited) in many recent hits. That role is now expanding as directors and animators are beginning a new era of movies, in which mathematics helps introduce another dimension to the two-dimensional screen. The images you see are created with geometry, linear algebra, partial differential equations, and vector analysis. Animators' algorithms employ ideas from these and other areas to depict the reflection and refraction of light and create life-like images of hair, water, and skin—even when it's blue.

Analysts predict that television viewing in 3D will eventually become commonplace, although it could take a few years. Presently, researchers are working to solve problems such as managing the many different viewing angles possible at home. Their efforts will give us more than richer entertainment, too. Scientists will be better able to visualize objects, such as molecules, with 3D-technology and surgeons will have the ability to design more precise treatments and implement them more effectively.

**For More Information:** "The Race for Real-time Photorealism," Henrik Wann Jensen and Tomas Akenine-Möller, *American Scientist*, March-April 2010.



Image courtesy of Twentieth Century Fox.



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