



Playing the Game

Video games are a lot of fun, but they'd be much less fun without mathematics. Geometry, calculus, and linear algebra all help make characters, scenes, and action look less two-dimensional and more realistic. And, as one game company executive noted, advancing through mathematics is similar to working through the increasingly more difficult levels of a video game. Who knows, by graduation you may have enough skills to save the world.

Much of a character's movement involves *inverse kinematics*: For example, what should the angles of the foot, shin, and upper leg be as a character runs? This is an important area of research that also involves collision and contact detection (obvious in the real world, but requiring explicit calculation in the video world). There can be an infinite number of answers to such problems but fast algorithms must find realistic solutions in less time than you can say "The leg bone's connected to the hip bone."

For More Information: *Essential Mathematics for Games and Interactive Applications*, James Van Verth and Lars Bishop, 2004.



Image courtesy of Electronic Arts.



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