

Computer-Animated Fluids to Flow Naturally

Computer-animated fluids are set to become more realistic as developers have learned to tweak the physical equations used in their creation. A team of scientists in California have just published a paper detailing their new approach to recreating fluid movement digitally.

To create the complex animations found in many PC games requires chains of mathematical equations, and those used to represent fluid motion accurately are among the most challenging. Now researchers at the California Institute of Technology have identified a new approach to the recreate the movement of fluids digitally, according to a paper published by the team.

In order to make fluid animation look convincing, some animators end up drawing it by hand – an effective but time consuming method. But scientist Mathieu Desbrun and his team have adopted an approach based on new mathematics called ‘discrete differential

geometry’. The system uses equations designed specifically to be solved by computers rather than people. His research could be significant for the gaming graphics community – it means fluids can be made to flow more accurately on screen and the time and cost involved in making an animation could be significantly reduced.

Essentially the method uses equations based on physical properties not usually expressed in traditional equations. For example, traditional equations consider the velocity of a liquidly it bypasses

So far, he says, the method “has been shown to provide good statistical predictability ... ensuring high visual quality.” But some further development is still required before it will be made available to software animation studios. If the equations were uses in animation software, a computer artist could easily create a fluid animation far more accurately than they can today.