

Partial Differential Equations for Fluid Flow and Computer Graphics

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Scientists, engineers and mathematicians have used numerical techniques for partial differential equations to simulate physical phenomena for many years. More recently, these numerical techniques have worked their way into a variety of new areas including computer graphics. Some key techniques will be discussed including the Level Set Method for tracking interfaces and discontinuities, the Ghost Fluid Method for accurate modeling of boundary conditions at these interfaces and discontinuities, and Vorticity Confinement as a method of removing excess numerical dissipation on coarse grids. Example simulations of smoke, fire and water will be shown. Time permitting, we will also discuss numerical methods for cloth.