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3.2.6 Examples with Conservative Forces3.2.7 Examples with Dissipative Forces; 3.3 Euler's Equations of Motion; Chapter 4. Deformable Bodies; 4.1 Elasticity, Stress, and Strain; 4.2 Mass-Spring Systems; 4.2.1 One-Dimensional Array of Masses; 4.2.2 Two-Dimensional Array of Masses; 4.2.3 Three-Dimensional Array of Masses; 4.2.4 Arbitrary Configurations; 4.3 Control Point Deformation; 4.3.1 B-Spline Curves; 4.3.2 NURBS Curves; 4.3.3 B-Spline Surfaces; 4.3.4 NURBS Surfaces; 4.3.5 Surfaces Built from Curves; 4.4 Free-Form Deformation; 4.5 Implicit Surface Deformation; 4.5.1 Level Set Extraction
4.5.2 Isocurve Extraction in 2D Images4.5.3 Isosurface Extraction in 3D Images; Chapter 5.Fluids and Gases; 5.1 Vector Calculus; 5.1.1 Gradient, Directional Derivative, and Total Derivative; 5.1.2 Vector Fields, Divergence, and Laplacian; 5.1.3 Curl; 5.1.4 Line Integrals; 5.1.5 Surface Integrals and Stokes' Theorem; 5.1.6 Volume Integrals and the Divergence Theorem; 5.1.7 Green's Theorem, Laplace's Equation, and Poisson'sEquation; 5.1.8 Vector Field Decomposition; 5.2 Strain and Stress; 5.2.1 Strain Tensor; 5.2.2 Stress Tensor; 5.2.3 The Relationship Between Strain and Stress
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5.7.5 Include Temperature

Sommario/riassunto

Create physically realistic 3D Graphics environments with this introduction to the ideas and techniques behind the process. Author David H. Eberly includes simulations to introduce the key problems involved and then gradually reveals the mathematical and physical concepts needed to solve them. He then describes all the algorithmic foundations and uses code examples and working source code to show how they are implemented, culminating in a large collection of physical simulations. The book tackles the complex, challenging issues that other books avoid, including Lagrangian dynamics, rigid body dynamics, impulse methods, resting contact, linear complementarity problems, deformable bodies, mass-spring systems, friction, numerical solution of differential equations, numerical stability and its relationship to physical stability, and Verlet integration methods. This book even describes when real physics isn't necessary - and hacked physics will do.