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Collana	Mathematics for Industry, , 2198-350X ; ; 4
Disciplina	006.60151
Soggetti	Signal processing Image processing Speech processing systems Computer graphics Computer science—Mathematics Computer mathematics Applied mathematics Engineering mathematics Signal, Image and Speech Processing Computer Graphics Mathematical Applications in Computer Science Mathematical and Computational Engineering
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Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references at the end of each chapters and index.
Nota di contenuto	Part I Mathematical approaches to computer graphics and vision.- The Power of Orthogonal Duals -- Mathematical Models of Visual Information Processing in the Human Brain and Applications to Visual Illusions and Image Processing -- Decomposition and clustering for the visualization of dynamical system -- Probable and Improbable Faces -- Part II Sound and scene rendering -- Progress in Digital Sound Synthesis for Physically Based Animation -- Efficient Image-based Rendering Method using Spherical Gaussian -- A Lie theoretic proposal on algorithms for spherical harmonic lighting -- Interactive Editing of Volumetric Objects by Using Feature-based Transfer Function --

Feature-based Approach for the Interactive Editing of Environmental Lighting Effects -- Ray Tracing of Quadratic Parametric Surface -- Part III Fluid and flow -- A Flexible Image Processing Approach to the Surfacing of Particle-Based Fluid Animation -- Inverse Approach for Visual Simulation of Clouds -- Generating Flow Fields Variations using Laplacian Eigenfunctions -- Blood flow analysis using medical imaging data and streamline visualization -- Part IV Deformation and locomotion -- Discrete Isoperimetric Deformation of Discrete Curves -- Mathematical Formulation of Motion and Deformation and its Applications -- Anti-commutative Dual Complex Number and 2D Rigid Transformation -- Phase Dynamics on the Modified Oscillators in Bipedal Locomotion -- Part V Image database and applications -- Single-view 3D Reconstruction by Learning 3D Game Scenes -- Facial Aging Simulation by Patch-based Texture Synthesis with Statistical Wrinkle Aging Pattern Model -- Animating images of cooking using video examples and image deformation -- Detection of inserted text in images.

Sommario/riassunto

This book presents revised versions of the best papers selected from the symposium “Mathematical Progress in Expressive Image Synthesis” (MEIS2013) held in Fukuoka, Japan, in 2013. The topics cover various areas of computer graphics (CG), such as surface deformation/editing, character animation, visual simulation of fluids, texture and sound synthesis, and photorealistic rendering. From a mathematical point of view, the book also presents papers addressing discrete differential geometry, Lie theory, computational fluid dynamics, function interpolation, and learning theory. This book showcases the latest joint efforts between mathematicians, CG researchers, and practitioners exploring important issues in graphics and visual perception. The book provides a valuable resource for all computer graphics researchers seeking open problem areas, especially those now entering the field who have not yet selected a research direction.