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Soggetti	Numerical analysis Differential equations Mathematics for scientists & engineers Theoretical methods Partial differential equations Computer science Biology and other natural sciences
Lingua di pubblicazione	Inglese
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Nota di contenuto	A level set method for the numerical simulation of damage evolution / Gregoire Allaire, Francois Jouve, Nicolas Van Goethem -- Dissipation inequalities in systems theory: An introduction and recent results / Christian Ebenbauer, Tobias Raff, Frank Allgower -- Some nonlinear problems involving non-local diffusions / Luis A. Caffarelli -- High- order methods for PDEs: Recent advances and new perspectives / Claudio Canuto -- Radar imaging / Margaret Cheney -- Adaptive approximations by greedy algorithms / Albert Cohen -- Multiscale analysis of density functional theory / Weinan E -- Frictional contact in solid mechanics / Michel Fortin, Carl Robitaille, Andre Fortin, Ali Rezgui -- Numerical methods for fully nonlinear elliptic equations / Roland Glowinski -- Asymptotic solutions of Hamilton-Jacobi equations for large time and related topics / Kenji Nishihara -- Hyperbolic conservation laws. Past and future / Barbara Lee Keyfitz -- Second- order PDE's and deterministic games / Robert V. Kohn, Sylvia Serfaty --

Controllability and observability: From ODEs to quasilinear hyperbolic systems / Tatsien Li -- Order-value optimization and new applications / Jose Mario Martinez -- Conformation dynamics / Christof Schutte, Frank Noe, Eike Meerbach, Philipp Metzner, Carsten Hartmann -- MCMC methods for sampling function space / Alexandros Beskos, Andrew M. Stuart -- Chaotic itinerancy reality in the dynamic brain - episodic memory formation / Ichiro Tsuda -- Visibility and invisibility / Gunther Uhlmann -- Optimal algorithms for discretized partial differential equations / Jinchao Xu -- Leonhard Euler: His life, the man, and his works / Walter Gautschi.

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## Sommario/riassunto

The International Council for Industrial and Applied Mathematics (ICIAM) is the worldwide organisation of societies which are dedicated primarily or significantly to applied and/or industrial mathematics. The ICIAM Congresses, held every 4 years, are run under the auspices of the Council with the aim to advance the applications of mathematics in all parts of the world. The 6th ICIAM Congress was held in Zurich, Switzerland, 16-20 July 2007, and was attended by more than 3000 scientists from 47 countries. This volume collects the invited lectures of this Congress, the appreciations of the ICIAM Prize winners' achievements and the Euler Lecture celebrating the 300th anniversary of Euler. The authors of these papers are leading researchers of their fields, rigorously selected by a distinguished international program committee. The book presents an overview of contemporary applications of mathematics, new perspectives and open problems. Topics embrace analysis of and numerical methods for: linear and nonlinear partial differential equations multiscale modeling nonlinear problems involving integral operators controllability and observability asymptotic solutions of Hamilton-Jacobi equations contact problems in solid mechanics topology optimization of structures dissipation inequalities in systems theory greedy algorithms sampling in function space order-value optimization parabolic partial differential equations and deterministic games Moreover, particular applications involve risk in financial markets, radar imaging, brain dynamics, complex geometric optics applied to acoustics and electromagnetics.

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