

1. Record Nr.	UNINA9910454364803321
Titolo	Numerical methods for viscosity solutions and applications [[electronic resource] /] / editors, Maurizio Falcone, Charalampos Makridakis
Pubbl/distr/stampa	Singapore, : World Scientific, c2001
ISBN	1-281-95136-6 9786611951368 981-279-980-X
Descrizione fisica	1 online resource (249 p.)
Collana	Series on advances in mathematics for applied sciences ; ; 59
Altri autori (Persone)	FalconeMaurizio MakridakisCharalampos
Disciplina	515
Soggetti	Viscosity solutions Calculus of variations Electronic books.
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references.
Nota di contenuto	Foreword; CONTENTS; Geometrical Optics and Viscosity Solutions; 1 High frequency waves and WKB method; 2 The Kravtsov-Ludwig method; 3 Multivalued solutions to the eikonal equation and shadow zones; References; Computation of Vorticity Evolution for a Cylindrical Type-II Superconductor Subject to Parallel and Transverse Applied Magnetic Fields; 1 Introduction; 2 The Models; 3 Discretization of the Models; 4 Numerical Computations; References; A Characterization of the Value Function for a Class of Degenerate Control Problems; 1 Introduction; 2 Assumptions and definitions 3 A characterization of the value function4 Approximation of the value function; References; Some Microstructures in Three Dimensions; 1 Introduction; 2 A three dimensional example; 3 Minimizing sequences; 4 Numerical experiments; References; Convergence of Numerical Schemes for the Approximation of Level Set Solutions to Mean Curvature Flow; 1 Introduction; 2 Background; 3 The Crandall-Lions scheme; 4 Finite element method; References; Optimal Discretization Steps in Semi-Lagrangian Approximation of First-Order PDEs; 1 Introduction; 2 Construction of the schemes and basic convergence

## theory

3 Fully discrete second and third order schemes  
4 Relationship between time and space step; 5 Numerical tests; Conclusions; References;  
Convergence Past Singularities to the Forced Mean Curvature Flow for a Modified Reaction-Diffusion Approach; 1 Introduction; 2 Approximate Traveling Wave; 3 Viscosity Solutions; 4 Supersolutions; 5 Comparison Lemma; 6 Convergence and interfaces error estimates; References; The Viscosity-Duality Solutions Approach to Geometric Optics for the Helmholtz Equation; 1 Weak solutions to the differential problem; 2 A class of numerical approximations  
3 Numerical results  
4 Conclusion; References; Adaptive Grid Generation for Evolutive Hamilton-Jacobi-Bellman Equations; 1 Introduction; 2 Discretization in time and space; 3 Error estimation; 4 Implementation details; 5 Numerical examples; References; Solution and Application of Anisotropic Curvature Driven Evolution of Curves (and Surfaces); 1 Introduction; 2 Direct approach using porous-medium like equations; 3 Direct approach by intrinsic heat equations; 4 Solution using level set equation; 5 Phase field approximation of interface motion; References  
An Adaptive Scheme on Unstructured Grids for the Shape-From-Shading Problem  
1 Introduction; 2 A fixed grid fully discrete scheme; 3 A local error indicator; 4 The adaptive grid algorithm; 5 Implementation of the algorithm; 6 Numerical experiments; References; On A Posteriori Error Estimation For Constant Obstacle Problems; 1 Introduction; 2 Results and their discussion; 3 Proofs; References

## Sommario/riassunto

The volume contains twelve papers dealing with the approximation of first and second order problems which arise in many fields of application including optimal control, image processing, geometrical optics and front propagation. Some contributions deal with new algorithms and technical issues related to their implementation. Other contributions are more theoretical, dealing with the convergence of approximation schemes. Many test problems have been examined to evaluate the performances of the algorithms. The volume can attract readers involved in the numerical approximation of differential mod