

1. Record Nr.	UNINA9910299787703321
Autore	Katzourakis Nikos
Titolo	An Introduction To Viscosity Solutions for Fully Nonlinear PDE with Applications to Calculus of Variations in L // by Nikos Katzourakis
Pubbl/distr/stampa	Cham : , : Springer International Publishing : , : Imprint : Springer, , 2015
ISBN	3-319-12829-9
Edizione	[1st ed. 2015.]
Descrizione fisica	1 online resource (125 p.)
Collana	SpringerBriefs in Mathematics, , 2191-8198
Disciplina	510 515.353 515.64
Soggetti	Differential equations, Partial Calculus of variations Partial Differential Equations Calculus of Variations and Optimal Control; Optimization
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	Preface; Acknowledgments; Contents; 1 History, Examples, Motivation and First Definitions; References; 2 Second Definitions and Basic Analytic Properties of the Notions; References; 3 Stability Properties of the Notions and Existence via Approximation; References; 4 Mollification of Viscosity Solutions and Semiconvexity; References; 5 Existence of Solution to the Dirichlet Problem via Perron's Method; References; 6 Comparison Results and Uniqueness of Solution to the Dirichlet Problem; References 7 Minimisers of Convex Functionals and Existence of Viscosity Solutions to the Euler-Lagrange PDEReferences; 8 Existence of Viscosity Solutions to the Dirichlet Problem for the infty-Laplacian; References; 9 Miscellaneous Topics and Some Extensions of the Theory; 9.1 Fundamental Solutions of the infty-Laplacian; 9.1.1 The infty-Laplacian and Tug-of-War Differential Games; 9.1.2 Discontinuous Coefficients, Discontinuous Solutions; 9.1.3 Barles-Perthame Relaxed Limits (1-Sided Uniform Convergence) and Generalised 1-Sided Stability; 9.1.4 Boundary Jets and Jets Relative to

Non-open Sets

9.1.5 Nonlinear Boundary Conditions 9.1.6 Comparison Principle for Viscosity Solutions Without Decoupling in the x-variable; References

Sommario/riassunto

The purpose of this book is to give a quick and elementary, yet rigorous, presentation of the rudiments of the so-called theory of Viscosity Solutions which applies to fully nonlinear 1st and 2nd order Partial Differential Equations (PDE). For such equations, particularly for 2nd order ones, solutions generally are non-smooth and standard approaches in order to define a "weak solution" do not apply: classical, strong almost everywhere, weak, measure-valued and distributional solutions either do not exist or may not even be defined. The main reason for the latter failure is that, the standard idea of using "integration-by-parts" in order to pass derivatives to smooth test functions by duality, is not available for non-divergence structure PDE.