1. Record Nr. UNINA9910818175103321

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Titolo	Non-smooth deterministic or stochastic discrete dynamical systems : applications to models with friction or impact / / Jerome Bastien, Frederic Bernardin, Claude-Henri Lamarque
Pubbl/distr/stampa	London, : ISTE Hoboken, N.J., : Wiley, 2013
ISBN	9781118604083 1118604083 9781118604045 1118604040 9781299402447 1299402445 9781118604328 1118604326
Edizione	[1st ed.]
Descrizione fisica	1 online resource (514 p.)
Collana	Mechanical engineering and solid mechanics series
Altri autori (Persone)	BernardinFrederic LamarqueClaude-Henri
Disciplina	620.00151539
Soggetti	Dynamics - Mathematical models Friction - Mathematical models Impact - Mathematical models
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 and index.
Nota di contenuto	Title Page; Contents; Introduction; Chapter 1. Some Simple Examples; 1.1. Introduction; 1.2. Frictions; 1.2.1. Coulomb's law; 1.2.2. Differential equation with univalued operator and usual sign; 1.2.3. Differential equation with multivalued term: differential inclusion; 1.2.4. Other friction laws; 1.3. Impact; 1.3.1. Difficulties with writing the differential equation; 1.3.2. Ill-posed problems; 1.4. Probabilistic context; Chapter 2. Theoretical Deterministic Context; 2.1. Introduction; 2.2. Maximal monotone operators and first result on differential inclusions (in R) 2.2.1. Graphs (operators) definitions2.2.2. Maximal monotone

operators; 2.2.3. Convex function, sub-differentials and operators; 2.2.4. Resolvent and regularization; 2.2.5. Taking the limit; 2.2.6. First result of existence and uniqueness for a differential inclusion; 2.3. Extension to any Hilbert space; 2.4. Existence and uniqueness results in Hilbert space; 2.5. Numerical scheme in a Hilbert space; 2.5.1. The numerical scheme; 2.5.2. State of the art summary and results shown in this publication; 2.5.3. Convergence (general results and order 1/2); 2.5.4. Convergence (order one)
2.5.5. Change of scalar product2.5.6. Resolvent calculation; 2.5.7. More regular schemes; Chapter 3. Stochastic Theoretical Context; 3.1. Introduction; 3.2. Stochastic integral; 3.2.1. The stochastic processes background; 3.2.2. Stochastic integral; 3.3. Stochastic differential equations; 3.3.1. Existence and uniqueness of strong solution; 3.3.2. Existence and uniqueness of weak solution; 3.3.3. Kolmogorov and Fokker-Planck equations; 3.4. Multivalued stochastic differential equations; 3.4.1. Problem statement; 3.4.2. Uniqueness and existence results; 3.5. Numerical scheme
3.5.1. Which convergence: weak or strong?3.5.2. Strong convergence results; 3.5.3. Weak convergence results; Chapter 4. Riemannian Theoretical Context; 4.1. Introduction; 4.2. First or second order; 4.3. Differential geometry; 4.3.1. Sphere case; 4.3.2. General case; 4.4. Dynamics of the mechanical systems; 4.4.1. Definition of mechanical system; 4.4.2. Equation of the dynamics; 4.5. Connection, covariant derivative, geodesics and parallel transport; 4.6. Maximal monotone term; 4.7. Stochastic term; 4.8. Results on the existence and uniqueness of a solution; Chapter 5. Systems with Friction
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5.3.5. Free oscillations

Sommario/riassunto

This book contains theoretical and application-oriented methods to treat models of dynamical systems involving non-smooth nonlinearities.The theoretical approach that has been retained and underlined in this work is associated with differential inclusions of mainly finite dimensional dynamical systems and the introduction of maximal monotone operators (graphs) in order to describe models of impact or friction. The authors of this book master the mathematical, numerical and modeling tools in a particular way so that they can propose all aspects of the approach, in both a deterministic