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	Titolo	Variational Inequalities and Frictional Contact Problems / / by Anca Capatina
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	Descrizione fisica	1 online resource (242 p.)
	Collana	Advances in Mechanics and Mathematics, , 1571-8689 ; ; 31
	Disciplina	515.64
	Soggetti	Manifolds (Mathematics)
		Complex manifolds
		Geometry, Differential
		Applied mathematics
		Engineering mathematics
		Manifolds and Cell Complexes (incl. Diff.Topology)
		Differential Geometry
		Mathematical and Computational Engineering
	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	Introduction -- Part I: Preliminaries -- Spaces of Real-valued Functions -- Spaces of Vector-valued Functions -- Part II: Variational Inequalities -- Existence and Uniqueness Results -- Some Properties of Solutions -- Dual Formulations -- Approximations of Variational Inequalities -- Part III: Contact Problems with Friction in Elasticity -- Static Problems -- Quasistatic Problems.
	Sommario/riassunto	Variational Inequalities and Frictional Contact Problems contains a carefully selected collection of results on elliptic and evolutionary quasi-variational inequalities including existence, uniqueness, regularity, dual formulations, numerical approximations and error estimates ones. By using a wide range of methods and arguments, the results are presented in a constructive way, with clarity and well justified proofs. This approach makes the subjects accessible to mathematicians and applied mathematicians. Moreover, this part of the book can be used as an excellent background for the investigation of

more general classes of variational inequalities. The abstract variational inequalities considered in this book cover the variational formulations of many static and quasi-static contact problems. Based on these abstract results, in the last part of the book, certain static and quasi-static frictional contact problems in elasticity are studied in an almost exhaustive way. The readers will find a systematic and unified exposition on classical, variational and dual formulations, existence, uniqueness and regularity results, finite element approximations and related optimal control problems. This part of the book is an update of the Signorini problem with nonlocal Coulomb friction, a problem little studied and with few results in the literature. Also, in the quasi-static case, a control problem governed by a bilateral contact problem is studied. Despite the theoretical nature of the presented results, the book provides a background for the numerical analysis of contact problems. The materials presented are accessible to both graduate/under graduate students and to researchers in applied mathematics, mechanics, and engineering. The obtained results have numerous applications in mechanics, engineering and geophysics. The book contains a good amount of original results which, in this unified form, cannot be found anywhere else.