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Titolo	Geometry of nonholonomically constrained systems [[electronic resource] /] / Richard Cushman, Hans Duistermaat, Jędrzej Śniatycki
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Altri autori (Persone)	DuistermaatJ. J <1942-2010.> (Johannes Jisse) ŚniatyckiJędrzej
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Nota di bibliografia	Includes bibliographical references (p. 387-393) and index.
Nota di contenuto	Contents; Acknowledgments; Foreword; 1. Nonholonomically constrained motions; 1.1 Newton's equations; 1.2 Constraints; 1.3 Lagrange-d'Alembert equations; 1.4 Lagrange derivative in a trivialization; 1.5 Hamilton-d'Alembert equations; 1.6 Distributional Hamiltonian formulation; 1.6.1 The symplectic distribution (H <sub>c</sub> ); 1.6.2 H <sub>c</sub> and $\omega_c$ in a trivialization; 1.6.3 Distributional Hamiltonian vector field; 1.7 Almost Poisson brackets; 1.7.1 Hamilton's equations; 1.7.2 Nonholonomic Dirac brackets; 1.8 Momenta and momentum equation; 1.8.1 Momentum functions; 1.8.2 Momentum equations; 1.8.3 Homogeneous functions; 1.8.4 Momenta as coordinates; 1.9 Projection principle; 1.10 Accessible sets; 1.11 Constants of motion; 1.12 Notes; 2. Group actions and orbit spaces; 2.1 Group actions; 2.2 Orbit spaces; 2.3 Isotropy and orbit types; 2.3.1 Isotropy types; 2.3.2 Orbit types; 2.3.3 When the action is proper; 2.3.4 Stratification on by orbit types; 2.4 Smooth structure on an orbit space; 2.4.1 Differential structure; 2.4.2 The orbit space as a differential space; 2.5 Subcartesian spaces; 2.6 Stratification of the orbit space by orbit types;

2.6.1 Orbit types in an orbit space  
 2.6.2 Stratification of an orbit space  
 2.6.3 Minimality of  $S$ ; 2.7  
 Derivations and vector fields on a differential space; 2.8 Vector fields  
 on a stratified differential space; 2.9 Vector fields on an orbit space;  
 2.10 Tangent objects to an orbit space; 2.10.1 Stratified tangent  
 bundle; 2.10.2 Zariski tangent bundle; 2.10.3 Tangent cone; 2.10.4  
 Tangent wedge; 2.11 Notes; 3. Symmetry and reduction; 3.1 Dynamical  
 systems with symmetry; 3.1.1 Invariant vector fields; 3.1.2 Reduction of  
 symmetry; 3.1.3 Reduction for a free and proper  $G$ -action; 3.1.4  
 Reduction of a nonfree, proper  $G$ -action  
 3.2 Nonholonomic singular reduction for a proper action  
 3.3  
 Nonholonomic reduction for a free and proper action; 3.4 Chaplygin  
 systems; 3.5 Orbit types and reduction; 3.6 Conservation laws; 3.6.1  
 Momentum map; 3.6.2 Gauge momenta; 3.7 Lifted actions and the  
 momentum equation; 3.7.1 Lifted actions; 3.7.2 Momentum equation;  
 3.8 Notes; 4. Reconstruction, relative equilibria and relative periodic  
 orbits; 4.1 Reconstruction; 4.1.1 Reconstruction for proper free actions;  
 4.1.2 Reconstruction for nonfree proper actions; 4.1.3 Application to  
 nonholonomic systems; 4.2 Relative equilibria  
 4.2.1 Basic properties  
 4.2.2 Quasiperiodic relative equilibria; 4.2.3  
 Runaway relative equilibria; 4.2.4 Relative equilibria when the action is  
 not free; 4.2.5 Other relative equilibria in a  $G$ -orbit; 4.2.5.1 When the  
 $G$ -action is free; 4.2.5.2 When the  $G$ -action is not free; 4.2.6 Smooth  
 families of quasiperiodic relative equilibria; 4.2.6.1 Elliptic, regular, and  
 stably elliptic elements of  $\mathfrak{g}$ ; 4.2.6.2 When the  $G$ -action is free and  
 proper; 4.2.6.3 When the  $G$ -action is proper but not free; 4.3 Relative  
 periodic orbits; 4.3.1 Basic properties; 4.3.2 Quasiperiodic relative  
 periodic orbits  
 4.3.3 Runaway relative periodic orbits

## Sommario/riassunto

This book gives a modern differential geometric treatment of linearly nonholonomically constrained systems. It discusses in detail what is meant by symmetry of such a system and gives a general theory of how to reduce such a symmetry using the concept of a differential space and the almost Poisson bracket structure of its algebra of smooth functions. The above theory is applied to the concrete example of Caratheodory's sleigh and the convex rolling rigid body. The qualitative behavior of the motion of the rolling disk is treated exhaustively and in detail. In particular, it classifies all mot

2. Record Nr.	UNINA9910767507003321
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Descrizione fisica	1 online resource (X, 388 p. 159 illus.)
Collana	Studies in Big Data, , 2197-6503 ; ; 23
Disciplina	004.6780151932
Soggetti	Computational intelligence Artificial intelligence Medical informatics Biomedical engineering Medicine - Practice Computational Intelligence Artificial Intelligence Health Informatics Biomedical Engineering and Bioengineering Practice and Hospital Management
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di bibliografia	Includes bibliographical references at the end of each chapters.
Sommario/riassunto	This comprehensive book focuses on better big-data security for healthcare organizations. Following an extensive introduction to the Internet of Things (IoT) in healthcare including challenging topics and scenarios, it offers an in-depth analysis of medical body area networks with the 5th generation of IoT communication technology along with its nanotechnology. It also describes a novel strategic framework and computationally intelligent model to measure possible security vulnerabilities in the context of e-health. Moreover, the book addresses healthcare systems that handle large volumes of data driven by patients' records and health/personal information, including big-data-based knowledge management systems to support clinical decisions.

Several of the issues faced in storing/processing big data are presented along with the available tools, technologies and algorithms to deal with those problems as well as a case study in healthcare analytics. Addressing trust, privacy, and security issues as well as the IoT and big-data challenges, the book highlights the advances in the field to guide engineers developing different IoT devices and evaluating the performance of different IoT techniques. Additionally, it explores the impact of such technologies on public, private, community, and hybrid scenarios in healthcare. This book offers professionals, scientists and engineers the latest technologies, techniques, and strategies for IoT and big data.

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