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Autore	Cushman Richard H. <1942->
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Altri autori (Persone)	DuistermaatJ. J <1942-2010.> (Johannes Jisse) SniatyckiJędrzej
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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 _c); 1.6.2 H _c and ω_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;

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 Derivations and vector fields on a differential space; 2.8 Vector fields
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 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
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 systems; 3.5 Orbit types and reduction; 3.6 Conservation laws; 3.6.1
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 orbits; 4.1 Reconstruction; 4.1.1 Reconstruction for proper free actions;
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 stably elliptic elements of \mathfrak{g} ; 4.2.6.2 When the G -action is free and
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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