Introduction to Terrain-Vehicle Systems

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Recent developments in the mechanics of vehicle mobility both on land and off the road were treated in the author's previous books on "Theory of Land Locomotion" and "Off the Road Locomotion", which have become standard works on the subject. The present book integrates the fundamental theory and practice of vehicle locomotion by the application of systems analysis to terrain-vehicle systems.

The first part of the book treats the terrain and begins with the discussion of techniques and instrumentation for measuring the physical characteristics of the terrain. The evaluation of vertical and horizontal stress–strain relationships are considered in detail and applied to estimate the load-deformation of soils under single and repetitive loading. The chapter on geometry of the terrain surface, the distribution and variability of physical and geometrical terrain values, and sampling methods includes a wealth of important information in the traffic-ability of soils.

The second part of the book on the vehicle considers the fundamentals of the mission and concept and treats the basic models of soil-vehicle relationships, dynamic vehicle behavior and vehicle performance, including the author's own investigations. The powerful tool of systems analysis is applied to the stages of selecting vehicle concepts for a given mission and environment, the evaluation of a vehicle concept or component idea and the implementation of the terrain-vehicle systems evaluation.

The book is written in a lucid style, and is well illustrated by clear diagrams and photographs. It contains both stimulating ideas and practical information from the author's wide experience and includes numerous references to the extensive literature, which has been critically reviewed. This authoritative presentation on terrain–vehicle systems can be warmly recommended to both scientists and engineers alike concerned with the subject of wide interest.

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