DESCRIPTION

This book brings together in a single volume various methods and skills for particle-scale or discrete-element numerical simulation of granular media. It covers a broad range of topics from basic concepts and methods towards more advanced aspects and technical details applicable to the current research on granular materials.

Discrete-element simulations of granular materials are based on four basic models (molecular dynamics, contact dynamics, quasi-static and event driven) dealing with frictional contact interactions and integration schemes for the equations of dynamics. These models are presented in the first chapters of the book, followed by various methods for sample preparation and monitoring of boundary conditions, as well as dimensionless control parameters. Granular materials encountered in real life involve a variety of compositions (particle shapes and size distributions) and interactions (cohesive, hydrodynamic, thermal) that have been extensively covered by several chapters. The book ends with two applications in the field of geo-materials.

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