

1. Record Nr.	UNINA9910831049103321
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Titolo	The combined finite-discrete element method [[electronic resource] /] / Ante Munjiza
Pubbl/distr/stampa	Hoboken, NJ, : Wiley, c2004
ISBN	1-280-27485-9 9780470020172 9786610274857 0-470-02017-2 0-470-02018-0
Descrizione fisica	1 online resource (349 p.)
Disciplina	620.00151535 620.1/123/015118 620.1123015118
Soggetti	Deformations (Mechanics) - Mathematical models Finite element method
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 (p. [319]-330) and index.
Nota di contenuto	The Combined Finite-Discrete Element Method; Contents; Preface; Acknowledgements; 1 Introduction; 1.1 General Formulation of Continuum Problems; 1.2 General Formulation of Discontinuum Problems; 1.3 A Typical Problem of Computational Mechanics of Discontinua; 1.4 Combined Continua-Discontinua Problems; 1.5 Transition from Continua to Discontinua; 1.6 The Combined Finite-Discrete Element Method; 1.7 Algorithmic and Computational Challenge of the Combined Finite-Discrete Element Method; 2 Processing of Contact Interaction in the Combined Finite Discrete Element Method; 2.1 Introduction 2.2 The Penalty Function Method 2.3 Potential Contact Force in 2D; 2.4 Discretisation of Contact Force in 2D; 2.5 Implementation Details for Discretised Contact Force in 2D; 2.6 Potential Contact Force in 3D; 2.6.1 Evaluation of contact force; 2.6.2 Computational aspects; 2.6.3 Physical interpretation of the penalty parameter; 2.6.4 Contact damping; 2.7 Alternative Implementation of the Potential Contact

Force; 3 Contact Detection; 3.1 Introduction; 3.2 Direct Checking Contact Detection Algorithm; 3.2.1 Circular bounding box; 3.2.2 Square bounding object; 3.2.3 Complex bounding box
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3.8.4 Representation of mapping3.9 Selection of Contact Detection Algorithm; 3.10 Generalisation of Contact Detection Algorithms to 3D Space; 3.10.1 Direct checking contact detection algorithm; 3.10.2 Binary tree search; 3.10.3 Screening contact detection algorithm; 3.10.4 Direct mapping contact detection algorithm; 3.11 Generalisation of Munjiza-NBS Contact Detection Algorithm to Multidimensional Space; 3.12 Shape and Size Generalisation-Williams C-GRID Algorithm; 4 Deformability of Discrete Elements; 4.1 Deformation; 4.2 Deformation Gradient; 4.2.1 Frames of reference
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5.2 Dynamics of Irregular Discrete Elements Subject to Finite Rotations in 3D

Sommario/riassunto

The combined finite discrete element method is a relatively new computational tool aimed at problems involving static and / or dynamic behaviour of systems involving a large number of solid deformable bodies. Such problems include fragmentation using explosives (e.g rock blasting), impacts, demolition (collapsing buildings), blast loads, digging and loading processes, and powder technology. The combined finite-discrete element method - a natural extension of both discrete and finite element methods - allows researchers to model problems involving the deformability of either one solid body,
