Numerical Methods In Geotechnical Engineering By Desai

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Numerical Methods in Geotechnical Engineering IX, Volume 1 Numerical Methods in Geotechnical Engineering
First Published in 2017. Routledge is an imprint of Taylor & Francis, an Informa company.
Numerical Methods and Implementation in Geotechnical Engineering - Part 1 CRC Press
NUMGE 2018 is the ninth in a series of conferences on Numerical Methods in Geotechnical Engineering organized by the ERTC7 under the auspices of the International Society for Soil Mechanics and Geotechnical Engineering (ISSMGE). The first conference was held in 1986 in Stuttgart, Germany and the series continued every four years (1990 Santander, Spain; 1994 Manchester, United Kingdom; 1998 Udine, Italy; 2002 Paris, France; 2006 Graz, Austria; 2010 Trondheim, Norway; 2014 Delft, The Netherlands). The conference provides a forum for exchange of ideas and discussion on topics related to numerical modelling in geotechnical engineering. Both senior and young researchers, as well as scientists and engineers from Europe and overseas, are invited to attend this conference to share and exchange their knowledge and experiences. This work is the first volume of NUMGE 2018.
Numerical Methods in Geotechnical Engineering CRC Press
This practical guide provides the best introduction to large deformation material point method (MPM) simulations for geotechnical engineering. It provides the basic theory, discusses the different numerical features used in large deformation simulations, and presents a number of applications -- providing references, examples and guidance when using MPM for practical applications. MPM covers problems in static and dynamic situations within a common framework. It also opens new frontiers in geotechnical modelling and numerical analysis. It represents a powerful tool for exploring large deformation behaviours of soils, structures and fluids, and their interactions, such as internal and external erosion, and post-liquefaction analysis; for instance the post-failure liquid-like behaviours of landslides, penetration problems such as CPT and pile installation, and scouring problems related to underwater pipelines. In the recent years, MPM has developed enough for its practical use in industry, apart from the increasing interest in the academic world.
Numerical Methods in Geotechnical Engineering (GSP 96) McGraw-Hill Companies
The NUMGE98 Conference brought together senior and young researchers, scientists and practicing engineers from European and overseas countries, to share their knowledge and experience on the various aspects of the analysis of Geotechnical Problems through Numerical Methods. The papers address a broad spectrum of geotechnical problems, including tunnels and underground openings, shallow and deep foundations, slope stability, seepage and consolidation, partially saturated soils, geothermal effects, constitutive modelling, etc.
Numerical Methods in Geotechnical Engineering Springer Nature
Numerical Methods and Implementation in Geotechnical Engineering explains several numerical methods that are used in geotechnical engineering. The first part of this reference set includes methods such as the finite element method, distinct element method, discontinuous deformation analysis, numerical manifold method, smoothed particle hydrodynamics method, material point method, plasticity method, limit equilibrium and limit analysis, plasticity, slope stability and foundation engineering, optimization analysis and reliability analysis. The authors have also presented different computer programs associated with the materials in this book which will be useful to students learning how to apply the models explained in the text into practical situations when designing structures in locations with specific soil and rock settings. This reference book set is a suitable textbook primer for civil engineering students as it provides a basic introduction to different numerical methods (classical and modern) in comprehensive readable volumes.
Installation Effects in Geotechnical Engineering CRC Press
This book introduces the basic structure, modeling methods, numerical calculation processes, post-processing, and system functions of MatDEM, which applies the basic principles and algorithm of the discrete element method. The discrete element method can effectively simulate the discontinuity, inhomogeneity, and large deformation damage of rock and soil. It is widely used in both research and industry. Based on the innovative matrix discrete element computing method, the author developed the high-performance discrete element software MatDEM from scratch, which can handle millions of elements in discrete element numerical simulations. This book also presents several examples of

applications in geological and geotechnical engineering, including basic geotechnical engineering problems, discrete element tests, three dimensional landslides, and dynamic and multi-field coupling functions. Teaching videos and the relevant software can be accessed on the MATDEM website (http://matdem.com). The book serves as a useful reference for research and engineering staff, undergraduates, and postgraduates who work in the fields of geology, geotechnical, water conservancy, civil engineering, mining, and physics.

Notes on Numerical Modeling in Geomechanics CRC Press

It has become increasingly important, particularly in an urban environment, to predict soil behaviour and to confine the settlement or deformation of buildings adjacent to construction sites. One important factor is the choice of construction procedure for the installation of piles, sheet pile walls, anchors or for soil improvement techniques, ground freezing and tunnelling methods. The modelling of construction processes, which are frequently associated with large deformations of the soil and with strong changes in the structure of the soil around the construction plant, in the case of, for example, a drill, a bit, a vibrator, or an excavation tool, requires sophisticated and new methods in numerical modelling. Often the simulation of the construction procedure is neglected in the calculations. Such methods are described and discussed in this book, as are examples of the methods applied to geotechnical practice, field and laboratory testing as well as case studies. This volume provides a valuable source of reference for scientists in geotechnical engineering and numerical modelling, geotechnical engineers, post graduate students, construction companies and consultants, manufacturers of geotechnical construction plants and software suppliers and developers of geotechnical construction methods.

Numerical Analysis and Modelling in Geomechanics CRC Press

Modeling in Geotechnical Engineering is a one stop reference for a range of computational models, the theory explaining how they work, and case studies describing how to apply them. Drawing on the expertise of contributors from a range of disciplines including geomechanics, optimization, and computational engineering, this book provides an interdisciplinary guide to this subject which is suitable for readers from a range of backgrounds. Before tackling the computational approaches, a theoretical understanding of the physical systems is provided that helps readers to fully grasp the significance of the numerical methods. The various models are presented in detail, and advice is provided on how to select the correct model for your application. Provides detailed descriptions of different computational modelling methods for geotechnical applications, including the finite element method, the finite difference method, and the boundary element method Gives readers the latest advice on the use of big data analytics and artificial intelligence in geotechnical engineering Includes case studies to help readers apply the methods described in their own work

Numerical Modelling of Construction Processes in Geotechnical Engineering for Urban Environment Bentham Science Publishers

Numerical Methods and Implementation in Geotechnical Engineering explains several numerical methods that are used in geotechnical engineering. The second part of this reference set includes more information on the distinct element method, geotechnical optimization analysis and reliability analysis. Information about relevant additional numerical methods is also provided in each chapter with problems where applicable. The authors have also presented different computer programs associated with the materials in this book set which will be useful to students learning how to apply the models explained in the text into practical situations when designing structures in locations with specific soil and rock settings. This reference book set is a suitable textbook primer for civil engineering students as it provides a basic introduction to different numerical methods (classical and modern) in comprehensive readable volumes.

Applied Soil Mechanics with ABAQUS Applications CRC Press

Numerical methods are very powerful tools for use in geotechnical engineering, particularly in computational geotechnics. Interest is strong in the new field of multi-phase nature of geomaterials, and the area of computational geotechnics is expanding. Alongside their companion volume Computational Modeling of Multiphase Geomaterials (CRC Press, 2012), Fusao Oka and Sayuri Kimoto cover recent progress in several key areas, such as air-water-soil mixture, cyclic constitutive models, anisotropic models, noncoaxial models, gradient models, compaction bands (a form of volumetric strain localization and strain localization under dynamic conditions), and the instability of unsaturated soils. The text also includes applications of computational modeling to large-scale excavation of ground, liquefaction analysis of levees during earthquakes, methane hydrate development, and the characteristics of contamination using bentonite. The erosion of embankments due to seepage flow is also presented.

Innovative Numerical Modelling in Geomechanics CRC Press

Numerical Methods in Geotechnical Engineering IX contains 204 technical and scientific papers presented at the 9th European Conference on Numerical Methods in Geotechnical Engineering (NUMGE2018, Porto, Portugal, 25—27 June 2018). The papers cover a wide range of topics in the field of computational geotechnics, providing an overview of recent developments on scientific achievements, innovations and engineering applications related to or employing numerical methods. They deal with subjects from emerging research to engineering practice, and are grouped under the following themes: Constitutive modelling and numerical implementation Finite element, discrete element and other numerical methods. Coupling of diverse methods Reliability and probability analysis Large deformation – large strain analysis Artificial intelligence and neural networks Ground flow, thermal and coupled analysis Earthquake engineering, soil dynamics and soil-structure interactions Rock mechanics Application of numerical methods in the context of the Eurocodes Shallow and deep foundations Slopes and cuts Supported excavations and retaining walls Embankments and dams Tunnels and caverns (and pipelines) Ground improvement and reinforcement Offshore geotechnical engineering Propagation of vibrations Following the objectives of previous eight thematic conferences, (1986 Stuttgart, Germany; 1990 Santander, Spain; 1994 Manchester, United Kingdom; 1998 Udine, Italy; 2002 Paris, France; 2006 Graz, Austria; 2010 Trondheim, Norway; 2014 Delft, The Netherlands), Numerical Methods in Geotechnical Engineering IX updates the state-of-the-art regarding the application of numerical methods in geotechnics, both in a scientific perspective and in what concerns its application for solving practical boundary value problems. The book will be much of interest to engineers, academics and professionals involved or interested in Geotechnical Engineering. This is volume 2 of the NUMGE 2018 set.

Numerical Methods in Geotechnical Engineering CRC Press

Since the 1990s five books onApplications of Computational Mechanics in Geotechnical Engineering have been published. Innovative Numerical Modelling in Geomechanics is

the 6th and final book in this series, and contains papers written by leading experts on computational mechanics. The book treats highly relevant topics in the field of geotechnic

Publication CRC Press

Modeling and computing is becoming an essential part of the analysis and design of an engineered system. This is also true of "geotechnical systems", such as soil foundations, earth dams and other soil-structure systems. The general goal of modeling and computing is to predict and understand the behaviour of the system subjected to a variety of possible conditions/scenarios (with respect to both external stimuli and system parameters), which provides the basis for a rational design of the system. The essence of this is to predict the response of the system to a set of external forces. The modelling and computing essentially involve the following three phases: (a) Idealization of the actual physical problem, (b) Formulation of a mathematical model represented by a set of equations governing the response of the system, and (c) Solution of the governing equations (often requiring numerical methods) and graphical representation of the numerical results. This book will introduce these phases. MATLAB® codes and MAPLE® worksheets are available for those who have bought the book. Please contact the author at mbulker@itu.edu.tr or canulker@gmail.com. Kindly provide the invoice number and date of purchase.

Advances in Numerical Methods in Geotechnical Engineering John Wiley & Sons

A simplified approach to applying the Finite Element Method to geotechnical problems Predicting soil behavior by constitutive equations that are based on experimental findings and embodied in numerical methods, such as the finite element method, is a significant aspect of soil mechanics. Engineers are able to solve a wide range of geotechnical engineering problems, especially inherently complex ones that resist traditional analysis. Applied Soil Mechanics with ABAQUS® Applications provides civil engineering students and practitioners with a simple, basic introduction to applying the finite element method to soil mechanics problems. Accessible to someone with little background in soil mechanics and finite element analysis, Applied Soil Mechanics with ABAQUS® Applications explains the basic concepts of soil mechanics and then prepares the reader for solving geotechnical engineering problems using both traditional engineering solutions and the more versatile, finite element solutions. Topics covered include: Properties of Soil Elasticity and Plasticity Stresses in Soil Consolidation Shear Strength of Soil Shallow Foundations Lateral Earth Pressure and Retaining Walls Piles and Pile Groups Seepage Taking a unique approach, the author describes the general soil mechanics for each topic, shows traditional applications of these principles with longhand solutions, and then presents finite element solutions for the same applications, comparing both. The book is prepared with ABAQUS® software applications to enable a range of readers to experiment firsthand with the principles described in the book (the software application files are available under "student resources" at www.wiley.com/college/helwany). By presenting both the traditional solutions alongside the FEM solutions, Applied Soil Mechanics with ABAQUS® Applications is an ideal introduction to traditional soil mechanics and a guide to alternative solutions and emergent methods. Dr. Helwany also has an online course based on the book available at www.geomilwaukee.com.

Computational Multiphase Geomechanics Thomas Telford

In geomechanics, existing design methods are very much dependent upon sophisticated on-site techniques to assess ground conditions. This book describes numerical analysis, computer simulation and modelling that can be used to answer some highly complex questions associated with geomechanics. The contributors, who are all international experts in the field, also give insights into the future directions of these methods. Numerical Analysis and Modelling in Geomechanics will appeal to professional engineers involved in designing and building both onshore and offshore structures, where geomechanical considerations may well be outside the usual codes of practice, and therefore specialist advice is required. Postgraduate researchers, degree students carrying out project work in this area will also find the book an invaluable resource.

Numerical Methods and Implementation in Geotechnical Engineering – Part 2 CRC Press

This volume deals with numerical simulation of coupled problems in soil mechanics and foundations. It contains analysis of both shallow and deep foundations. Several nonlinear problems are considered including, soil plasticity, cracking, reaching the soil bearing capacity, creep, etc. Dynamic analyses together with stability analysis are also included. Several numerical models of dams are considered together with coupled problems in soil mechanics and foundations. It gives wide range of modeling soil in different parts of the world. The volume is based on the best contributions to the 2nd GeoMEast International Congress and Exhibition on Sustainable Civil Infrastructures, Egypt 2018 – The official international congress of the Soil-Structure Interaction Group in Egypt (SSIGE).

Advances in Discontinuous Numerical Methods and Applications in Geomechanics and Geoengineering CRC Press

The development of constitutive relations for geotechnical materials, with the help of numerical models, have increased notably the ability to predict and to interpret mechanical behaviour of geotechnical works. These proceedings cover the applications of computational mechanics in this area.

Deterministic Numerical Modeling of Soil Structure Interaction Academic Press

Numerical Methods and Implementation in Geotechnical Engineering explains several numerical methods that are used in geotechnical engineering. The first part of this reference set includes methods such as the finite element method, distinct element method, discontinuous deformation analysis, numerical manifold method, smoothed particle hydrodynamics method, material point method, plasticity method, limit equilibrium and limit analysis, plasticity, slope stability and foundation engineering, optimization analysis and reliability analysis. The authors have also presented different computer programs associated with the materials in this book which will be useful to students learning how to apply the models explained in the text into practical situations when designing structures in locations with specific soil and rock settings.This reference book set is a suitable textbook primer for civil engineering students as it provides a basic introduction to different numerical methods (classical and modern) in comprehensive readable volumes.

Numerical Methods in Geotechnical Engineering IX CRC Press

Developments in Geographic Information Technology have raised the expectations of users. A static map is no longer enough; there is now demand for a dynamic representation. Time is of great importance when operating on real world geographical phenomena, especially when these are dynamic. Researchers in the field of Temporal Geographical Information Systems (TGIS) have been developing methods of incorporating time into geographical information systems. Spatio-temporal analysis embodies spatial modelling, spatio-temporal modelling and spatial reasoning and data mining. Advances in Spatio-Temporal Analysis contributes to the field of spatio-temporal analysis, presenting innovative ideas and examples that reflect current progress and achievements.

Springer

In order to describe soil–structure interaction in various situations (nonlinear, static, dynamic, hydro-mechanical couplings), this book gives an overview of the main modeling methods developed in geotechnical engineering. The chapters are centered around: the finite element

method (FEM), the finite difference method (FDM), and the discrete element method (DEM). Deterministic Numerical Modeling of Soil–Structure Interaction allows the reader to explore the classical and well-known FEM and FDM, using interface and contact elements available for coupled hydro-mechanical problems. Furthermore, this book provides insight on the DEM, adapted for interaction laws at the grain level. Within a classical finite element framework, the concept of macro-element is introduced, which generalizes constitutive laws of SSI and is particularly straightforward in dynamic situations. Finally, this book presents the SSI, in the case of a group of structures, such as buildings in a town, using the notion of metamaterials and a geophysics approach.