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## KEY=INTERFACES - SAVAGE FRANKLIN

## MECHANICS OF MATERIALS AND INTERFACES

## THE DISTURBED STATE CONCEPT

*CRC Press* The disturbed state concept (DSC) is a unified, constitutive modelling approach for engineering materials that allows for elastic, plastic, and creep strains, microcracking and fracturing, stiffening or healing, all within a single, hierarchical framework. Its capabilities go well beyond other available material models yet lead to significant simplifications for practical applications. Until now, however, there has been no resource that fully describes the theory, techniques, and potential of this powerful method. Mechanics of Materials and Interfaces: Disturbed State Concept presents a detailed theoretical treatment of the DSC and shows that it can provide a unified and simplified approach for mathematical characterization of the mechanical response of materials and interfaces. Within this comprehensive treatment, the author: Compares the DSC with other available models Identifies the physical meaning of the relevant parameters and presents procedures to determine them from laboratory test data Validates the DSC models with respect to laboratory tests used to find the parameters and independent tests not used in the calibration Implements the models in computer procedures Validates those procedures by comparing predictions with observations from simulated and field boundary value problems Solves problems from a variety of disciplines, including civil, mechanical, and electrical engineering If you are involved in the mechanics of materials, you owe it to yourself to explore the disturbed state concept. Mechanics of Materials and Interfaces provides the first-and to date, the only-comprehensive means of doing so.

## HANDBOOK OF MATERIALS BEHAVIOR MODELS, THREE-VOLUME SET

## NONLINEAR MODELS AND PROPERTIES

*Elsevier* This first of a kind reference/handbook deals with nonlinear models and properties of material. In the study the behavior of materials' phenomena no unique laws exist. Therefore, researchers often turn to models to determine the properties of materials. This will be the first book to bring together such a comprehensive collection of these models. The Handbook deals with all solid materials, and is organized first by phenomena. Most of the materials models presented in an applications-oriented fashion, less descriptive and more practitioner-geared, making it useful in the daily working activities of professionals. The Handbook is divided into three volumes. Volume I, Deformation of Materials, introduces general methodologies in the art of modeling, in choosing materials, and in the "so-called" size effect. Chapters 2-5 deal respectively with elasticity and viscoelasticity, yield limit, plasticity, and visco-plasticity. Volume II, Failures in Materials, provides models on such concerns as continuous damage, cracking and fracture, and friction wear. Volume III, Multiphysics Behavior, deals with multiphysics coupled behaviors. Chapter's 10 and 11 are devoted to special classes of materials (composites, biomaterials, and geomaterials). The different sections within each chapter describe one model each with its domain of validity, its background, its formulation, the identification of material parameters for as many materials as possible, and advice on how to implement or use the model. The study of the behavior of materials, especially solids, is related to hundreds of areas in engineering design and control. Predicting how a material will perform under various conditions is essential to determining the optimal performance of machines and vehicles and the structural integrity of buildings, as well as safety issues. Such practical examples would be how various new materials, such as those used in new airplane hulls, react to heat or cold or sudden temperature changes, or how new building materials hold up under extreme earthquake conditions. The Handbook of Materials Behavior Models: Gathers together 117 models of behavior of materials written by the most eminent specialists in their field Presents each model's domain of validity, a short background, its formulation, a methodology to identify the materials parameters, advise on how to use it in practical applications as well as extensive references Covers all solid materials: metals, alloys, ceramics, polymers, composites, concrete, wood, rubber, geomaterials such as rocks, soils, sand, clay, biomaterials, etc Concerns all engineering phenomena: elasticity, viscoelasticity, yield limit, plasticity, viscoplasticity, damage, fracture, friction, and wear

## ASSESSMENT AND PREVENTION OF FAILURE PHENOMENA IN ROCK ENGINEERING

*Routledge* First published in 1993. This volume is a collection of papers addressing the issue of the failure of rock engineering structures. This phenomenon occurs in different forms depending on the geometry of structure, material properties of intact rock, structure of rock mass, environmental conditions and initial state of stress.

## MECHANICS OF GEOMATERIAL INTERFACES

*Elsevier* The subject of geomaterial interfaces recognizes the important influences of the interface behaviour on the performance of interfaces involving cementaceous materials such as concrete and steel, ice-structure interfaces, concrete-rock interfaces and interfaces encountered in soil reinforcement. During the past two decades, the subject of geomaterial interfaces has attracted the concerted attention of scientists and engineers both in geomechanics and applied mechanics. These efforts have been largely due to the observation that the conventional idealizations of the behaviour of interfaces between materials by frictionless contact, bonded contact, Coulomb friction or finite friction tend to omit many interesting and important influences of special relevance to geomaterials. The significant manner in which non-linear effects, dilatancy, contact degradation, hardening and softening, etc., can influence the behaviour of the interface is borne out by experimental evidence. As a result, in many instances, the response of the interface can be the governing criterion in the performance of a geomechanics problem. The primary objective of this volume is to provide a documentation of recent advances in the area of geomaterial interfaces. The volume consists of subject groupings which cover ice-structure, soil-structure and steel-concrete interfaces, mechanics of rock and concrete joints and interfaces in discrete systems.

## MULTILEVEL MODELING OF SECURE SYSTEMS IN QOP-ML

*CRC Press* Introducing the Quality of Protection Modeling Language (QoP-ML), this book provides for the abstraction of security systems while maintaining emphasis on the details of quality protection . It delineates the steps used in cryptographic protocol and introduces a multilevel protocol analysis that expands current understanding. Every operation defined by QoP-ML is described within parameters of security metrics, therefore evaluating the impact of the operation on the entire system's security.

## ADVANCES IN TRANSPORTATION GEOTECHNICS

## PROCEEDINGS OF THE INTERNATIONAL CONFERENCE HELD IN NOTTINGHAM, UK, 25-27 AUGUST 2008

*CRC Press* Highways provide the arteries of modern society. The interaction of road, rail and other transport infrastructure with the ground is unusually intimate, and thus needs to be well-understood to provide economic and reliable infrastructure for society. Challenges include not only the design of new infrastructure (often on problematic ground), but inc

## COMPUTATIONAL MECHANICS '95

## VOLUME 1 AND VOLUME 2 THEORY AND APPLICATIONS

*Springer Science & Business Media* Al!, in the earlier conferences (Tokyo, 1986; Atlanta, 1988, Melbourne, 1991; and Hong Kong, 1992) the response to the call for presentations at ICES-95 in Hawaii has been overwhelming. A very careful screening of the extended abstracts resulted in about 500 paper being accepted for presentation. Out of these, written versions of about 480 papers reached the conference secretariat in Atlanta in time for inclusion in these proceedings. The topics covered at ICES-95 range over the broadest spectrum of computational engineering science. The editors thank the international scientific committee, for their advice and encouragement in making ICES-95 a successful scientific event. Special thanks are expressed to the International Association for Boundary Elements Methods for hosting IABEM-95 in conjunction with ICES-95. The editors here express their deepest gratitude to Ms. Stacy Morgan for her careful handling of a myriad of details of ICES-95, often times under severe time constraints. The editors hope that the readers of this proceedings will find a kaleidoscopic view of computational engineering in the year 1995, as practiced in various parts of the world. Satya N. Atluri Atlanta, Georgia, USA Genki Yagawa Tokyo,Japan Thomas A. Cruse Nashville, TN, USA Organizing Committee Professor Genki Yagawa, University of Tokyo, Japan, Chair Professor Satya Atluri, Georgia Institute of Technology, U.S.A.

## CONSTITUTIVE MODELING OF GEOMATERIALS

## ADVANCES AND NEW APPLICATIONS

*Springer Science & Business Media* The Second International Symposium on Constitutive Modeling of Geomaterials: Advances and New Applications (IS-Model 2012), is to be held in Beijing, China, during October 15-16, 2012. The symposium is organized by Tsinghua University, the International Association for Computer Methods and Advances in Geomechanics (IACMAG), the Committee of Numerical and Physical Modeling of Rock Mass, Chinese Society for Rock Mechanics and Engineering, and the Committee of Constitutive Relations and Strength Theory, China Institution of Soil Mechanics and Geotechnical Engineering, China Civil Engineering Society. This Symposium follows the first successful International Workshop on Constitutive Modeling held in Hong Kong, which was organized by Prof. JH Yin in 2007. Constitutive modeling of geomaterials has been an active research area for a long period of time. Different approaches have been used in the development of various constitutive models. A number of models have been implemented in the numerical analyses of geotechnical structures. The objective of the symposium is to provide a forum for researchers and engineers working or interested in the area of constitutive modeling to meet together and share new ideas, achievements and experiences through presentations and discussions. Emphasis is placed on recent advances of constitutive modeling and its applications in both theoretic and experimental aspects. Six famous scholars have been invited for the plenary speeches of the symposiums. Some prominent scholars have been invited to organize four specialized workshops on hot topics, including "Time-dependent stress-strain behavior of geomaterials", "Constitutive modeling within critical state soil mechanics", "Multiscale and multiphysics in geomaterials", and "Damage to failure in rock structures". A total of 49 papers are included in the above topics. In addition, 51 papers are grouped under three topics covering "Behaviour of geomaterials", "Constitutive model", and "Applications". The editors expect that the book can be helpful as a reference to all those in the field of constitutive modeling of geomaterials.

## ANALYTICAL METHODS IN PETROLEUM UPSTREAM APPLICATIONS

*CRC Press* Effective measurement of the composition and properties of petroleum is essential for its exploration, production, and refining; however, new technologies and methodologies are not adequately documented in much of the current literature. Analytical Methods in Petroleum Upstream Applications explores advances in the analytical methods and instrumentation that allow more accurate determination of the components, classes of compounds, properties, and features of petroleum and its fractions. Recognized experts explore a host of topics, including: A petroleum molecular composition continuity model as a context for other analytical measurements A modern modular sampling system for use in the lab or the process area to collect and control samples for subsequent analysis The importance of oil-in-water measurements and monitoring The chemical and physical properties of heavy oils, their fractions, and products from their upgrading Analytical measurements using gas chromatography and nuclear magnetic resonance (NMR) applications Asphaltene and heavy ends analysis Chemometrics and modeling approaches for understanding petroleum composition and properties to improve upstream, midstream, and downstream operations Due to the renaissance of gas and oil production in North America, interest has grown in analytical methods for a wide range of applications. The understanding provided in this text is designed to help chemists, geologists, and chemical and petroleum engineers make more accurate estimates of the crude value to specific refinery configurations, providing insight into optimum development and extraction schemes.

## CHALLENGES AND INNOVATIONS IN GEOMECHANICS

## PROCEEDINGS OF THE 16TH INTERNATIONAL CONFERENCE OF IACMAG - VOLUME 1

*Springer Nature* This book gathers the latest advances, innovations, and applications in the field of computational geomechanics, as presented by international researchers and engineers at the 16th International Conference of the International Association for Computer Methods and Advances in Geomechanics (IACMAG 2020/21). Contributions include a wide range of topics in geomechanics such as: monitoring and remote sensing, multiphase modelling, reliability and risk analysis, surface structures, deep structures, dams and earth structures, coastal engineering, mining engineering, earthquake and dynamics, soil-atmosphere interaction, ice mechanics, landfills and waste disposal, gas and petroleum engineering, geothermal energy, offshore technology, energy geostructures, geomechanical numerical models and computational rail geotechnics.

## ADVANCED GEOTECHNICAL ENGINEERING

## SOIL-STRUCTURE INTERACTION USING COMPUTER AND MATERIAL MODELS

*CRC Press* Soil-structure interaction is an area of major importance in geotechnical engineering and geomechanics Advanced Geotechnical Engineering: Soil-Structure Interaction using Computer and Material Models covers computer and analytical methods for a number of geotechnical problems. It introduces the main factors important to the application of computer methods and constitutive models with emphasis on the behavior of soils, rocks, interfaces, and joints, vital for reliable and accurate solutions. This book presents finite element (FE), finite difference (FD), and analytical methods and their applications by using computers, in conjunction with the use of appropriate constitutive models; they can provide realistic solutions for soil–structure problems. A part of this book is devoted to solving practical problems using hand calculations in addition to the use of computer methods. The book also introduces commercial computer codes as well as computer codes developed by the authors. Uses simplified constitutive models such as linear and nonlinear elastic for resistance-displacement response in 1-D problems Uses advanced constitutive models such as elasticplastic, continued yield plasticity and DSC for microstructural changes leading to microcracking, failure and liquefaction Delves into the FE and FD methods for problems that are idealized as two-dimensional (2-D) and three-dimensional (3-D) Covers the application for 3-D FE methods and an approximate procedure called multicomponent methods Includes the application to a number of problems such as dams , slopes, piles, retaining (reinforced earth) structures, tunnels, pavements, seepage, consolidation, involving field measurements, shake table, and centrifuge tests Discusses the effect of interface response on the behavior of geotechnical systems and liquefaction (considered as a microstructural instability) This text is useful to practitioners, students, teachers, and researchers who have backgrounds in geotechnical, structural engineering, and basic mechanics courses.

## ADVANCES IN NUMERICAL METHODS IN GEOTECHNICAL ENGINEERING

## PROCEEDINGS OF 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)

*Springer* 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).

## APPLIED MECHANICS REVIEWS

## COMPUTER METHODS AND ADVANCES IN GEOMECHANICS

## PROCEEDINGS OF THE 10TH INTERNATIONAL CONFERENCE ON COMPUTER METHODS AND ADVANCES IN GEOMECHANICS, TUCSON, ARIZONA, USA, 7-12 JANUARY 2001

*CRC Press* Covering a wide range of topics involving both research developments and applications, resulting from the 10th International Conferecne on Computer Methods and Advances in Geomechanics (IACMAG) held in January 2001 in Tucson, Arizona, USA. The theme of the conference was Fundamentals through Applications. The up-to-date research results and applications in this 2-volume work (> 1900 pages) should serve as a valuable source of information for those engaged in research, analysis and design, practical application, and education in the fields of geomechanics and geotechnical engineering.

## ADVANCEMENTS IN UNSATURATED SOIL MECHANICS

## PROCEEDINGS OF THE 3RD GEOMEAST INTERNATIONAL CONGRESS AND EXHIBITION, EGYPT 2019 ON SUSTAINABLE CIVIL INFRASTRUCTURES – THE OFFICIAL INTERNATIONAL CONGRESS OF THE SOIL-STRUCTURE INTERACTION GROUP IN EGYPT (SSIGE)

*Springer Nature* This book presents the collection of technical papers which includes research on two important topics in geotechnical engineering; the characterization of unsaturated soils. The papers in this collection are representative of local challenges facing geotechnical engineers in the Middle East, but their contributions can also be extended to other regions of the world.

## PLASTICITY AND GEOTECHNICS

*Springer Science & Business Media* Plasticity and Geotechnics is the first attempt to summarize and present in a single volume the major achievements in the field of plasticity theory for geotechnical materials and its applications to geotechnical analysis and design. The book emerges from the author's belief that there is an urgent need for the geotechnical and solid mechanics community to have a unified presentation of plasticity theory and its application to geotechnical engineering.

## INELASTIC ANALYSIS OF SOLIDS AND STRUCTURES

*Springer Science & Business Media* Inelastic Analysis of Solids and Structures presents in a unified manner the physical and theoretical background of inelastic material models and computational methods, and illustrates the behavior of the models in typical engineering conditions. The book describes experimental observations and principles of mechanics, and efficient computational algorithms for stress calculations as typically performed in finite element analysis. The theoretical background is given to an extent necessary to describe the commonly employed material models in metal isotropic and orthotropic plasticity, thermoplasticity and viscoplasticity, and the plasticity of geological materials. The computational algorithms are developed in a unified manner with some detailed derivations of the algorithmic relations. Many solved examples are presented, which are designed to give insight into the material behavior in various engineering conditions, and to demonstrate the application of the computational algorithms.

## PREDICTION, ANALYSIS AND DESIGN IN GEOMECHANICAL APPLICATIONS

## PROCEEDINGS OF THE ELEVENTH INTERNATIONAL CONFERENCE ON COMPUTER METHODS AND ADVANCES IN GEOMECHANICS, TORINO, ITALY, 19-24 JUNE 2005

## GEOTECHNICAL CHARACTERISATION AND GEOENVIRONMENTAL ENGINEERING

## IGC 2016 VOLUME 1

*Springer* The book comprises selected proceedings of the 2016 annual conference of the Indian Geotechnical Society. The technical papers presented on the theme "Geotechnical Characterisation and Geoenvironmental Engineering" highlight the modified geotechnical properties of soil admixed industrial waste and also the characteristics of soil with different pore fluid under varying test conditions. The major topics covered are (i) characterisation of soils, rocks and synthesised materials and (ii) geoenvironmental engineering and behaviour of unsaturated soil. This book will prove a valuable reference for researchers and practicing engineers alike.

## THE GEOTECHNICS OF HARD SOILS - SOFT ROCKS -

*CRC Press*

## MODELING IN GEOMECHANICS

*John Wiley & Sons Incorporated* Modeling in Geomechanics Edited by Musharraf Zaman The University of Oklahoma, USA Giancarlo Gioda Politecnico di Milano, Italy John Booker University of Sydney, Australia Geomechanics is an interdisciplinary field involving the study of natural and man-made systems with emphasis on the mechanics of various interacting phenomena. It comprises numerous aspects of engineering and scientific disciplines, which share common bases in mathematics, mechanics and physics. In recent years, with the extraordinary growth of computing power and resources, progress in the generation of new theories and techniques for the analysis of geomechanics problems has far surpassed their actual use by practitioners. This has led to a gap between our ability to deal with complex, inter-disciplinary problems in geomechanics and the actual impact of these advances on engineering practice. This book contains contributions from an international group of accomplished researchers and practitioners from various branches of soil and rock engineering, and presents the latest theoretical developments and practical applications of modeling in geomechanics. Chapters are grouped into four main sections: * Computational procedures * Constitutive modeling and testing * Modeling and simulation * Applications Efforts have been made to include recent developments and provide suggestions and examples as to how these can be applied in modeling actual engineering problems. Researchers, practitioners and students in geomechanics, mechanics of solids, soil and rock engineering will find this book an invaluable reference.

## INTRODUCTORY FINITE ELEMENT METHOD

*CRC Press* Although there are many books on the finite element method (FEM) on the market, very few present its basic formulation in a simple, unified manner. Furthermore, many of the available texts address either only structure-related problems or only fluid or heat-flow problems, and those that explore both do so at an advanced level. Introductory Finite Element Method examines both structural analysis and flow (heat and fluid) applications in a presentation specifically designed for upper-level undergraduate and beginning graduate students, both within and outside of the engineering disciplines. It includes a chapter on variational calculus, clearly presented to show how the functionals for structural analysis and flow problems are formulated. The authors provide both one- and two-dimensional finite element codes and a wide range of examples and exercises. The exercises include some simpler ones to solve by hand calculation-this allows readers to understand the theory and assimilate the details of the steps in formulating computer implementations of the method. Anyone interested in learning to solve boundary value problems numerically deserves a straightforward and practical introduction to the powerful FEM. Its clear, simplified presentation and attention to both flow and structural problems make Introductory Finite Element Method the ideal gateway to using the FEM in a variety of applications.

## ROCK MECHANICS AND ENGINEERING VOLUME 1

## PRINCIPLES

*CRC Press* Principles is the first volume of the five-volume set Rock Mechanics and Engineering and contains twenty-four chapters from key experts in the following fields: - Discontinuities; - Anisotropy; - Rock Stress; - Geophysics; - Strength Criteria; - Modeling Rock Deformation and Failure. The five-volume set "Comprehensive Rock Engineering", which was published in 1993, has had an important influence on the development of rock mechanics and rock engineering. Significant and extensive advances and achievements in these fields over the last 20 years now justify the publishing of a comparable, new compilation. Rock Mechanics and Engineering represents a highly prestigious, multi-volume work edited by Professor Xia-Ting Feng, with the editorial advice of Professor John A. Hudson. This new compilation offers an extremely wideranging and comprehensive overview of the state-of-

the-art in rock mechanics and rock engineering and is composed of peer-reviewed, dedicated contributions by all the key experts worldwide. Key features of this set are that it provides a systematic, global summary of new developments in rock mechanics and rock engineering practices as well as looking ahead to future developments in the fields. Contributors are worldrenowned experts in the fields of rock mechanics and rock engineering, though younger, talented researchers have also been included. The individual volumes cover an extremely wide array of topics grouped under five overarching themes: Principles (Vol. 1), Laboratory and Field Testing (Vol. 2), Analysis, Modelling and Design (Vol. 3), Excavation, Support and Monitoring (Vol. 4) and Surface and Underground Projects (Vol. 5). This multi-volume work sets a new standard for rock mechanics and engineering compendia and will be the go-to resource for all engineering professionals and academics involved in rock mechanics and engineering for years to come.

## ENVIRONMENTAL ROCK ENGINEERING

## PROCEEDINGS OF THE FIRST KYOTO INTERNATIONAL SYMPOSIUM ON UNDERGROUND ENVIRONMENT, KYOTO, JAPAN, 17-18 MARCH 2003

*CRC Press* This book is a collection of papers presented at the 1st Kyoto International Symposium on Underground Environment entitled "Role of Geo-technology to the Underground Environment". Consists of nine keynote papers, thirty-one technical papers and fifteen papers resulting from the poster presentations, each covering a vital aspect of underground engineering.

## STRUCTURAL ANALYSIS IN MICROELECTRONICS AND FIBER OPTIC SYSTEMS

## DYNAMICS AT SOLID STATE SURFACES AND INTERFACES

## VOLUME 2: FUNDAMENTALS

*John Wiley & Sons* Presents the state of the art of ultrafast/femtosecond structural and electronic dynamics of elementary processes at solid surfaces and interfaces, and presents the current status of photoinduced processes Covers concepts, experiments, new femtosecond and attosecond time-resolved methods, and the most recent advances Volume 1 covers fundamental concepts to introduce the basic questions, set the stage, and provide the basis for understanding and appreciating the individual achievements that have been made in the field. Volume 2 covers....

## CONTINUUM MODELS FOR MATERIALS WITH MICROSTRUCTURE

*John Wiley & Son Limited* Continuum Models for Materials with Microstructure Edited by H. B. Mühlhaus, CSIRO, Nedlands, Australia When the characteristic length-scale ('fabric dimension') of the microstructure of materials is not small when compared to the macroscopic dimensions, the well established framework for the modelling of deformation processes for simple materials needs enhancement. To introduce an internal length scale, one has to resort to continuum models such as Nonlocal Theories, Cosserat or Gradient-type Models, Discrete Element and Lattice Theories or modified Viscoplastic Models. These new approaches are addressed in this volume. It includes contributions from research areas as diverse as bio-mechanics, concrete engineering and solid state physics. Generalised continuum models and its applications are presented and complemented by numerical and analytical tools for the solution of boundary value problems.

## NUMERICAL METHODS AND CONSTITUTIVE MODELLING IN GEOMECHANICS

*Springer* The solution of stress analysis problems through numerical, computer oriented techniques is becoming more and more popular in soil and rock engineering. This is due to the ability of these methods to handle geometrically complex problems even in the presence of highly nonlinear material behaviour, characterizing the majority of soils and rocks, and of media consisting of two or more phases, like saturated and partially saturated soils. Aim of this book is to present to researchers and engineers working in the various branches of geomechanics an updated state of the research on the development and application of numerical methods in geotechnical and foundation engineering. Particular attention is devoted to the formulation of nonlinear material models and to their use for the analysis of complex engineering problems. In addition to the constitutive modelling, other topics discussed concern the use of the finite element and boundary element methods in geomechanics; the dynamic analysis of inelastic and saturated soils; the solution of seepage, consolidation and coupled problems; the analysis of soil-structure interaction problems; the numerical procedures for the interpretation of field measurements; the analysis of tunnels and underground openings.

## PRACTICE OF DISCRETE ELEMENT METHOD IN SOIL-STRUCTURE INTERFACE MODELLING

*Springer Nature* This book is related to a parametric study of the soil–structural interface shearing behavior based on the numerical simulations of interface shear test with DEM, which is conducted from the role of soil properties, particle properties and structural properties. To aid readers in easily understanding the generation, implementation of models and controlling modes, for each part, the relevant code is provided in the text, and the whole source code of model is given in Appendix to share with readers for practice. The book is intended for graduate-level teaching and research in soil mechanics and geotechnical engineering, as well as in other related engineering specialties. This book is also of use to industry practitioners due to the inclusion of real-world applications, opening the door to advanced courses on modeling within the industrial engineering and operations research fields.

## MODERN APPROACHES TO PLASTICITY

*Elsevier* Constitutive modelling of granulate materials has achieved significant progress in recent times although some challenging problems still remain to be solved. Many of the 35 contributions in this volume are devoted to modelling but there are also papers investigating the phenomena to be modelled. For instance, there are reviews on several aspects of the behaviour of granulates which are mere material properties while other aspects are related to the ill-posedness of the corresponding boundary value problems. The work provides a comprehensive and up to date treatise on the theory of plasticity in granular materials, together with a great number of solution methods and applications. The volume is intended for researchers and practising engineers who wish to enhance their knowledge in this rapidly expanding field.

## NUMERICAL METHODS IN GEOTECHNICAL ENGINEERING

## SIXTH EUROPEAN CONFERENCE ON NUMERICAL METHODS IN GEOTECHNICAL ENGINEERING (GRAZ, AUSTRIA, 6-8 SEPTEMBER 2006)

*CRC Press* An overview of recent developments in constitutive modelling, numerical implementation issues, and coupled and dynamic analysis. There is a special section dedicated to the numerical modelling of ground improvement techniques, with applications of numerical methods for solving practical boundary value problems, such as deep excavations, tunnels, shallow and deep foundations, embankments and slopes. These proceedings not only contain the latest scientific research, but also give valuable insight into the applications of numerical methods in solving practical engineering problems, thus narrowing the gap between advanced academic research and practical application.

## FOURTH INTERNATIONAL CONFERENCE ON CONSTITUTIVE LAWS FOR ENGINEERING MATERIALS

## JULY 27-30, 1999, TROY, NEW YORK : CONFERENCE PAPERS

## JOURNAL OF THE MECHANICAL BEHAVIOR OF MATERIALS

## CONSTITUTIVE AND CENTRIFUGE MODELLING: TWO EXTREMES

## PROCEEDINGS OF THE WORKSHOP ON CONSTITUTIVE AND CENTRIFUGE MODELLING, MONTE VERITÀ, SWITZERLAND, 8-13 JULY 2001

*CRC Press* The extremes of constitutive and centrifuge modelling are explored here, with a range of lectures addressing specific areas of these two types of modelling as well as on specific design problems and the themes of failure, deformations and interfaces.

## CONSTITUTIVE LAWS FOR ENGINEERING MATERIALS

## RECENT ADVANCES AND INDUSTRIAL AND INFRASTRUCTURE APPLICATIONS : PROCEEDINGS OF THE THIRD INTERNATIONAL CONFERENCE ON CONSTITUTIVE LAWS FOR ENGINEERING MATERIALS--THEORY AND APPLICATIONS, HELD JANUARY 7-12, 1991, IN TUCSON, ARIZONA, USA

*Amer Society of Mechanical*

## FRONTIERS OF ROCK MECHANICS AND SUSTAINABLE DEVELOPMENT IN THE 21ST CENTURY

*CRC Press* These proceedings contain the scientific contributions presented at the 2nd Asian Rock Mechanics Symposium (ISRM 2001 - 2nd ARMS). The theme of the symposium was "Frontiers of Rock Mechanics and Sustainable Development in the 21st Century".

## PRE-FAILURE DEFORMATION CHARACTERISTICS OF GEOMATERIALS

## PROCEEDINGS OF THE SECOND INTERNATIONAL SYMPOSIUM ON PRE-FAILURE DEFORMATION CHARACTERISTICS OF GEOMATERIALS : TORINO 99 : TORINO, ITALY 28-30 SEPTEMBER, 1999

*CRC Press* The second of two volumes from the 1999 conference (v.1 was published in 1999) makes available the opening lecture on pre-failure behavior of soils as construction materials, as well as 24 contributions on various themes of the conference, laboratory tests, in situ tests, stress-strain behavior, applications and case histories. Some specific topics include time-dependent deformation characteristics of stiff geomaterials, boundary value problems in geotechnical engineering, and the effect of reinforcement due to choice of geogrid. There is no subject index. c. Book News Inc.

## COMPUTER SIMULATION OF EARTHQUAKE EFFECTS

## PROCEEDINGS OF SESSIONS OF GEO-DENVER 2000

*Amer Society of Civil Engineers* GSP 110 contains nine papers on computer simulation of earthquake effects presented at sessions of Geo-Denver 2000, held in Denver, Colorado, August 5-8, 2000.

## DISSERTATION ABSTRACTS INTERNATIONAL

## THE SCIENCES AND ENGINEERING. B

## COMPUTATIONAL MULTIPHASE GEOMECHANICS

*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.