Regularization Methods And Finite Element Approximation Of Hemivariational Inequalities With Applications To Nonmonotone Contact Problems

Meshfree MethodsExtended Finite Element MethodIUTAM Symposium on Analytical and Computational Fracture Mechanics of Non-Homogeneous MaterialsBridge Maintenance, Safety Management, Health Monitoring and Informatics - IABMAS '08Probabilistic Finite Element Model Updating Using Bayesian StatisticsSome Research Results on Bridge Health Monitoring, Maintenance and Safety IVFinite Element Methods for Viscous Incompressible FlowsComputer Vision - ECCV'96Computational Flexible Multibody DynamicsAdvances in Civil StructuresComputational Modelling of Concrete StructuresFinite Element Method and Reconstruction Algorithms in Electrical Impedance TomographyImage Matching and AnalysisIUTAM Symposium on Discretization Methods for Evolving DiscontinuitiesModeling of Inelastic Behavior of RC Structures Under Seismic LoadsFinite Elements in FluidsSolving the Inverse Problem of Electrocardiography in a Realistic EnvironmentMeshfree Methods for Partial Differential Equations IIIMeshfree Methods for Partial Differential Equations VIterative Regularization Methods for Nonlinear Ill-Posed ProblemsMoving Loads - Dynamic Analysis and Identification TechniquesNumerical Simulation of Mechatronic Sensors and ActuatorsArchives of Acoustics QuarterlyA Regularized Extended Finite Element Method for Modeling the Coupled Cracking and Delamination of Composite MaterialsDomain Decomposition Methods in Science and Engineering XVIILinear and Nonlinear Inverse Problems with Practical ApplicationsIterative Methods for Ill-Posed ProblemsGeometric Regularization in Bioluminescence TomographyRegularization Methods and Finite Element Approximation of Hemivariational Inequalities with Applications to Nonmonotone Contact ProblemsProceedings of the ASME Heat Transfer DivisionElectrical Impedance TomographyInternational Digital Imaging Correlation SocietyA Posteriori Error Analysis Via Duality TheoryModal Analysis Topics, Volume 3Regularization Theory for Ill-posed ProblemsLeast-Squares Finite Element MethodsIUTAM Symposium on Multiscale Problems in Multibody System ContactsNonlinear Finite Elements for Continua and StructuresNonsmooth Mechanics of SolidsExtended Finite Element and Meshfree Methods

Meshfree Methods

Inverse problems arise in practical applications whenever there is a need to interpret indirect measurements. This book explains how to identify ill-posed inverse problems arising in practice and gives a hands-on guide to designing computational solution methods for them, with related codes on an accompanying website. The guiding linear inversion examples are the problem of image deblurring, x-ray tomography, and backward parabolic problems, including heat transfer. A thorough treatment of electrical impedance tomography is used as the guiding nonlinear inversion example

which combines the analytic-geometric research tradition and the regularization-based school of thought in a fruitful manner. This book is complete with exercises and project topics, making it ideal as a classroom textbook or self-study guide for graduate and advanced undergraduate students in mathematics, engineering or physics who wish to learn about computational inversion. It also acts as a useful guide for researchers who develop inversion techniques in high-tech industry.

Extended Finite Element Method

This work provides a posteriori error analysis for mathematical idealizations in modeling boundary value problems, especially those arising in mechanical applications, and for numerical approximations of numerous nonlinear var- tional problems. An error estimate is called a posteriori if the computed solution is used in assessing its accuracy. A posteriori error estimation is central to m- suring, controlling and minimizing errors in modeling and numerical appr- imations. In this book, the main mathematical tool for the developments of a posteriori error estimates is the duality theory of convex analysis, documented in the well-known book by Ekeland and Temam ([49]). The duality theory has been found useful in mathematical programming, mechanics, numerical analysis, etc. The book is divided into six chapters. The first chapter reviews some basic notions and results from functional analysis, boundary value problems, elliptic variational inequalities, and finite element approximations. The most relevant part of the duality theory and convex analysis is briefly reviewed in Chapter 2.

IUTAM Symposium on Analytical and Computational Fracture Mechanics of Non-Homogeneous Materials

Domain decomposition is an active, interdisciplinary research field concerned with the development, analysis, and implementation of coupling and decoupling strategies in mathematical and computational models. This volume contains selected papers presented at the 17th International Conference on Domain Decomposition Methods in Science and Engineering. It presents the newest domain decomposition techniques and examines their use in the modeling and simulation of complex problems.

Bridge Maintenance, Safety Management, Health Monitoring and Informatics - IABMAS '08

Modal Analysis Topics Volume 3. Proceedings of the 29th IMAC, A Conference and Exposition on Structural Dynamics, 2011, the third volume of six from the Conference, brings together over 30 contributions to this important area of research and engineering. The collection presents early findings and case studies on fundamental and applied aspects of Structural

Dynamics.

Probabilistic Finite Element Model Updating Using Bayesian Statistics

This is the second, enhanced and updated edition of an essential text for students of mechatronics. It covers both the detailed physical modeling of mechatronic systems and their precise numerical simulation using the Finite Element (FE) method. New material includes a section discussing locking effects as occurring in the numerical computation of thin mechanical structures as well as a new chapter on computational aeroacoustics to study the complex phenomenon of flow induced noise.

Some Research Results on Bridge Health Monitoring, Maintenance and Safety IV

Finite Element Methods for Viscous Incompressible Flows

In recent years, there has been steady progress in the research of electrical impedance tomography (EIT), leading to important developments. These developments have excited interest in practitioners and researchers from a broad range of disciplines, including mathematicians devoted to uniqueness proofs and inverse problems, physicists dealing with bioimpedance, electronic engineerers involved in developing and extending its applications, and clinicians wishing to take advantage of this powerful new imaging method. With contributions from leading international researchers, Electrical Impedance Tomography: Methods, History and Applications provides an up-to-date review of the progress of EIT, the present state of knowledge, and a look at future advances and applications. Divided into four parts, the book presents an interdisciplinary approach. The first part discusses reconstruction algorithms while the second part describes the aspects of EIT instrumentation, including frequencies and electrodes. The third part features various EIT studies, such as breast cancer screening and artificial ventilation in intensive care units. The final part surveys new developments in magnetic induction tomography and magnetic resonance EIT (MREIT) as well as offers insight into three of the most productive and longstanding EIT research groups. The book also includes two nontechnical appendices that provide a brief and simple introduction to bioimpedance and the methods of EIT. Written in a style accessible to all related backgrounds, this reference will be helpful in establishing new methods and experiments of EIT, hopefully leading to radical breakthroughs in mainstream clinical practice.

Computer Vision - ECCV'96

Probabilistic Finite Element Model Updating Using Bayesian Statistics: Applications to Aeronautical and Mechanical Engineering Tshilidzi Marwala and Ilyes Boulkaibet, University of Johannesburg, South Africa Sondipon Adhikari, Swansea University, UK Covers the probabilistic finite element model based on Bayesian statistics with applications to aeronautical and mechanical engineering Finite element models are used widely to model the dynamic behaviour of many systems including in electrical, aerospace and mechanical engineering. The book covers probabilistic finite element model updating, achieved using Bayesian statistics. The Bayesian framework is employed to estimate the probabilistic finite element models which take into account of the uncertainties in the measurements and the modelling procedure. The Bayesian formulation achieves this by formulating the finite element model as the posterior distribution of the model given the measured data within the context of computational statistics and applies these in aeronautical and mechanical engineering. Probabilistic Finite Element Model Updating Using Bayesian Statistics contains simple explanations of computational statistical techniques such as Metropolis-Hastings Algorithm, Slice sampling, Markov Chain Monte Carlo method, hybrid Monte Carlo as well as Shadow Hybrid Monte Carlo and their relevance in engineering. Key features: Contains several contributions in the area of model updating using Bayesian techniques which are useful for graduate students. Explains in detail the use of Bayesian techniques to quantify uncertainties in mechanical structures as well as the use of Markov Chain Monte Carlo techniques to evaluate the Bayesian formulations. The book is essential reading for researchers, practitioners and students in mechanical and aerospace engineering.

Computational Flexible Multibody Dynamics

This monograph, written from a numerical analysis perspective, aims to provide a comprehensive treatment of both the mathematical framework and the numerical methods for flexible multibody dynamics. Not only is this field permanently and rapidly growing, with various applications in aerospace engineering, biomechanics, robotics, and vehicle analysis, its foundations can also be built on reasonably established mathematical models. Regarding actual computations, great strides have been made over the last two decades, as sophisticated software packages are now capable of simulating highly complex structures with rigid and deformable components. The approach used in this book should benefit graduate students and scientists working in computational mechanics and related disciplines as well as those interested in time-dependent partial differential equations and heterogeneous problems with multiple time scales. Additionally, a number of open issues at the frontiers of research are addressed by taking a differential-algebraic approach and extending it to the notion of transient saddle point problems.

Advances in Civil Structures

Meshfree methods for the numerical solution of partial differential equations are becoming more and more mainstream in

many areas of applications. This volume represents the state-of-the-art in meshfree methods. It consists of articles which address the different meshfree techniques, their mathematical properties and their application in applied mathematics, physics and engineering.

Computational Modelling of Concrete Structures

As the use of composite materials in aerospace structures continues to increase, the need to properly characterize these materials, especially in terms of damage tolerance, takes on additional importance. The world wide failure exercises (WWFE) are an example of the international interest in this issue. But though there has been a great deal of progress in understanding the initiation of damage and modeling damage propagation along known interfaces, methods that can capture the effects of interactions among various failure modes accurately remain elusive. A method of modeling coupled matrix cracks and delamination in laminated composite materials based on the finite element method has been developed and experimentally validated. Damage initiation is determined using the LARC03 failure criterion. Delamination along ply interfaces is modeled using cohesive zones. Matrix cracks are incorporated into the discretization of the problem domain through a robust Mesh-Independent Cracking (MIC) technique. The matrix cracking technique, termed the Regularized Extended Finite Element Method (Rx-FEM), uses regularized forms of the Heaviside and Dirac Delta generalized functions to transform the crack surface into a volumetric crack zone. The Regularized Extended Finite Element method is compared to benchmark cases. The sensitivity of the solution to mesh size and parameters within the cohesive zone model is studied. Finally, the full method with delamination is employed to study a set of experimental tests performed on open-hole quasi-isotropic laminates. The trends of hole-size and ply thickness are well predicted for the laminates. Rx-FEM is also able to simulate the pattern of damage, as demonstrated by comparisons to x-ray images. From the results of this series of analyses it can be concluded that failures occur when delamination originating at the hole links up with delamination originating at the edge along the path of matrix cracks.

Finite Element Method and Reconstruction Algorithms in Electrical Impedance Tomography

Collection of selected, peer reviewed papers from the 2013 International Conference on Civil, Architecture and Building Materials (3rd CEABM2013), May 24-26, 2013, Jinan, China. Volume is indexed by Thomson Reuters CPCI-S (WoS). This set of 346 peer reviewed papers covers the subject areas of Structural Engineering, Monitoring and Control of Structures, Structural Rehabilitation, Retrofitting and Strengthening, Reliability and Durability of Structures.

Image Matching and Analysis

Thismonograph is a valuable contribution to thehighly topical and extremly productive field ofregularisationmethods for inverse and ill-posed problems. The author is an internationally outstanding and acceptedmathematicianin this field. In his book he offers a well-balanced mixtureof basic and innovative aspects.He demonstrates new,differentiatedviewpoints, and important examples for applications. The bookdemontrates thecurrent developments inthe field of regularization theory,such as multiparameter regularization and regularization in learning theory. The book is written for graduate and PhDstudents and researchersin mathematics, natural sciences, engeneering, and medicine.

IUTAM Symposium on Discretization Methods for Evolving Discontinuities

Since their emergence, finite element methods have taken a place as one of the most versatile and powerful methodologies for the approximate numerical solution of Partial Differential Equations. These methods are used in incompressible fluid flow, heat, transfer, and other problems. This book provides researchers and practitioners with a concise guide to the theory and practice of least-square finite element methods, their strengths and weaknesses, established successes, and open problems.

Modeling of Inelastic Behavior of RC Structures Under Seismic Loads

An extensive collection of 550 revised papers on most recent advances in bridge maintenance, safety, management and life-cycle performance. This is a major contribution to the state-of-the-art in all aspects of the field, containing papers from leading experts. Set of Book with keynote papers and extended abstracts plus a 4500 pages, searchable, full-paper CD-ROM.

Finite Elements in Fluids

Solving the Inverse Problem of Electrocardiography in a Realistic Environment

Nonlinear inverse problems appear in many applications, and typically they lead to mathematical models that are ill-posed, i.e., they are unstable under data perturbations. Those problems require a regularization, i.e., a special numerical treatment. This book presents regularization schemes which are based on iteration methods, e.g., nonlinear Landweber iteration, level set methods, multilevel methods and Newton type methods.

Meshfree Methods for Partial Differential Equations III

In this thesis, we consider mechanical problems with nonmonotone contact, like adhesive problems, delamination problems, bilateral contact problems with nonmonotone friction law, nonmonotone unilateral contact, etc. In all of them the contact phenomena are described by nonmonotone and multivalued laws, which can be expressed by means of the Clarke subdifferential of a locally Lipschitz function called a nonconvex, nonsmooth superpotential. Problems involving such laws give rise to hemivariational inequalities introduced for the first time by the engineer Panagiotopoulos in the eighties. In this work, we combine the regularization techniques with the finite element method to approximate a special class of hemivariational inequalities with maximum (resp. minimum) superpotential. Using some classes of smoothing approximations for nonsmooth functions based on convolution, we provide a regularization procedure to smooth the nonsmooth superpotential. The non-differentiable functional is approximated by a family of differentiable ones. Convergence of the solution based on the regularized problem to the solution of the original problem is shown. Then, the finite element approach for the regularized problem is analysed and convergence results are given. As an application we consider some model examples from continuum mechanics with nonmonotone contact and present some numerical results.

Meshfree Methods for Partial Differential Equations V

Iterative Regularization Methods for Nonlinear Ill-Posed Problems

Nonsmooth mechanics is a relatively complex field and requires a good knowledge of mechanics as well as a good background in some parts of modern mathematics. The present volume of lecture notes follows a very successful advanced school, with the aim to cover as much as possible all these aspects. It includes contributions that cover mechanical aspects as well as the mathematical and numerical treatment.

Moving Loads - Dynamic Analysis and Identification Techniques

The interaction phenomenon is very common between different components of a mechanical system. It is a natural phenomenon and is found with the impact force in aircraft landing; the estimation of degree of ripeness of an apple from impact on a beam; the interaction of the magnetic head of a computer disk leading to miniature development of modern c

Numerical Simulation of Mechatronic Sensors and Actuators

Archives of Acoustics Quarterly

Ill-posed problems are encountered in countless areas of real world science and technology. A variety of processes in science and engineering is commonly modeled by algebraic, differential, integral and other equations. In a more difficult case, it can be systems of equations combined with the associated initial and boundary conditions. Frequently, the study of applied optimization problems is also reduced to solving the corresponding equations. These equations, encountered both in theoretical and applied areas, may naturally be classified as operator equations. The current textbook will focus on iterative methods for operator equations in Hilbert spaces.

A Regularized Extended Finite Element Method for Modeling the Coupled Cracking and Delamination of Composite Materials

In this book, the author examines mathematical aspects of finite element methods for the approximate solution of incompressible flow problems. The principal goal is to present some of the important mathematical results that are relevant to practical computations. In so doing, useful algorithms are also discussed. Although rigorous results are stated, no detailed proofs are supplied; rather, the intention is to present these results so that they can serve as a guide for the selection and, in certain respects, the implementation of algorithms.

Domain Decomposition Methods in Science and Engineering XVII

Vols. for 1975 contain selected papers from the International Symposium on Finite Element Methods in Flow Problems; vols. for 1976- contain selected papers from the International Conference on Finite Elements in Flow Problems.

Linear and Nonlinear Inverse Problems with Practical Applications

In China, the amount of deteriorating bridges is increasing gradually, andthe costs of maintenance, repair and rehabilitation of these bridges farexceed available budgets. Internationally, above issue also is paid moreattention. To alleviate this issue, the bridge engineering professioncontinues to take positive steps towards developing more comprehensivebridge monitoring and management systems. Therefore, it is significant tocombine some good works that have been done in this field, which is theoriginal objective to introduce the recent research results in the fields of bridge health monitoring, bridge maintenance and safety in the mainland of China. This project encompasses some aspects of bridge health monitoring, maintenance and safety. Specifically, it deals with: bridge health monitoring; bridge repair andrehabilitation issues; bridge related safety and other implications.

Iterative Methods for Ill-Posed Problems

Introduces the theory and applications of the extended finite element method (XFEM) in the linear and nonlinear problems of continua, structures and geomechanics Explores the concept of partition of unity, various enrichment functions, and fundamentals of XFEM formulation. Covers numerous applications of XFEM including fracture mechanics, large deformation, plasticity, multiphase flow, hydraulic fracturing and contact problems Accompanied by a website hosting source code and examples

Geometric Regularization in Bioluminescence Tomography

The numerical treatment of partial differential equations with particle methods and meshfree discretization techniques is an extremely active research field, both in the mathematics and engineering communities. Meshfree methods are becoming increasingly mainstream in various applications. Due to their independence of a mesh, particle schemes and meshfree methods can deal with large geometric changes of the domain more easily than classical discretization techniques. Furthermore, meshfree methods offer a promising approach for the coupling of particle models to continuous models. This volume of LNCSE is a collection of the papers from the proceedings of the Fifth International Workshop on Meshfree Methods, held in Bonn in August 2009. The articles address the different meshfree methods and their use in applied mathematics, physics and engineering. The volume is intended to foster this highly active and exciting area of interdisciplinary research and to present recent advances and findings in this field.

Regularization Methods and Finite Element Approximation of Hemivariational Inequalities with Applications to Nonmonotone Contact Problems

Proceedings of the ASME Heat Transfer Division

In recent years, discretization methods have been proposed which are more flexible and which have the potential of capturing (moving) discontinuities in a robust and efficient manner. This monograph assembles contributions of leading experts with the most recent developments in this rapidly evolving field. It provides the most comprehensive coverage of state-of-the art numerical methods for treating discontinuities in mechanics.

Electrical Impedance Tomography

Extended Finite Element and Meshfree Methods provides an overview of, and investigates, recent developments in extended finite elements with a focus on applications to material failure in statics and dynamics. This class of methods is ideally suited for applications, such as crack propagation, two-phase flow, fluid-structure-interaction, optimization and inverse analysis because they do not require any remeshing. These methods include the original extended finite element method, smoothed extended finite element method (XFEM), phantom node method, extended meshfree methods, numerical manifold method and extended isogeometric analysis. This book also addresses their implementation and provides small MATLAB codes on each sub-topic. Also discussed are the challenges and efficient algorithms for tracking the crack path which plays an important role for complex engineering applications. Explains all the important theory behind XFEM and meshfree methods Provides advice on how to implement XFEM for a range of practical purposes, along with helpful MATLAB codes Draws on the latest research to explore new topics, such as the applications of XFEM to shell formulations, and extended meshfree and extended isogeometric methods Introduces alternative modeling methods to help readers decide what is most appropriate for their work

International Digital Imaging Correlation Society

This collection represents a single volume of technical papers presented at the Annual International DIC Society Conference and SEM Fall Conference organized by the Society for Experimental Mechanics and Sandia National Laboratories and held in Philadelphia, PA, November 7-10, 2016. The volume presents early findings from experimental, standards development and various other investigations concerning digital image correlation - an important area within Experimental Mechanics. The area of Digital Image Correlation has been an integral track within the SEM Annual Conference spearheaded by Professor Michael Sutton from the University of South Carolina. In 2016, the SEM and Sandia joined their collaborative strengths to launch a standing fall meeting focusing specifically on developments in the area of Digital Image Correlation. The contributed papers within this volume span numerous technical aspects of DIC including standards development for the industry.

A Posteriori Error Analysis Via Duality Theory

This updated and expanded edition of the bestselling textbookprovides a comprehensive introduction to the methods and theory ofnonlinear finite element analysis. New material provides a conciseintroduction to some of the cutting-edge methods that have evolvedin recent years in the field of nonlinear finite element modeling,and includes the eXtended finite element method (XFEM),multiresolution continuum theory for multiscale microstructures,and dislocation-density-based crystalline plasticity. Nonlinear Finite Elements for Continua and Structures, SecondEdition focuses on the formulation and solution of discreteequations for various classes of problems that are of principalinterest in applications to solid and

structural mechanics. Topicscovered include the discretization by finite elements of continuain one dimension and in multi-dimensions; the formulation ofconstitutive equations for nonlinear materials and largedeformations; procedures for the solution of the discreteequations, including considerations of both numerical andmultiscale physical instabilities; and the treatment of structuraland contact-impact problems. Key features: Presents a detailed and rigorous treatment of nonlinear solidmechanics and how it can be implemented in finite elementanalysis Covers many of the material laws used in today's software andresearch Introduces advanced topics in nonlinear finite elementmodelling of continua Introduction of multiresolution continuum theory and XFEM Accompanied by a website hosting a solution manual andMATLAB® and FORTRAN code Nonlinear Finite Elements for Continua and Structures, SecondEdition is a must have textbook for graduate students inmechanical engineering, civil engineering, applied mathematics,engineering mechanics, and materials science, and is also anexcellent source of information for researchers and practitionersin industry.

Modal Analysis Topics, Volume 3

This volume constitutes the Proceedings of the IUTAM Symposium on "Analytical and Computational Fracture Mechanics of Non-homogeneous Materials", held in Cardiff from 18th to 22nd June 2001. The Symposium was convened to address and place on record topical issues in analytical and computational aspects of the fracture of non-homogeneous materials as they are approached by specialists in mechanics, materials science and related fields. The expertise represented in the Symposium was accordingly very wide, and many of the world's greatest authorities in their respective fields participated. Given the extensive range and scale of non-homogeneous materials, it had to be focussed to enhance the quality and impact of the Symposium. The range of non-homogeneous materials was limited to those that are inhomogeneous at the macroscopic level and/or exhibit strain softening. The issues of micro to macro scaling were not excluded even within this restricted range which covered materials such as rock, concrete, ceramics and composites on the one hand, and, on the other, those metallic materials whose ductile fracture is strongly influenced by the presence of inhomogeneities. The Symposium remained focussed on fundamental research issues of practical significance. These issues have many common features among seemingly disparate non-homogeneous materials.

Regularization Theory for Ill-posed Problems

Least-Squares Finite Element Methods

Since 1984 the EURO-C conference series (Split 1984, Zell am See 1990, Innsbruck 1994, Badgastein 1998, St Johann im Pongau 2003, Mayrhofen 2006, Schladming 2010) has provided a forum for academic discussion of the latest theoretical,

algorithmic and modelling developments associated with computational simulations of concrete and concrete structure

IUTAM Symposium on Multiscale Problems in Multibody System Contacts

Nonlinear Finite Elements for Continua and Structures

The investigation of multiscale problems in multibody system contacts is an interesting and timely topic which has been the subject of intensive research. This IUTAM Symposium facilitated discussions between researchers active in the field. This proceedings volume summarizes contributions of many authors active in the field and gives insight in very different areas of this fascinating research. It reviews the state-of-the-art and identifies future hot topics.

Nonsmooth Mechanics of Solids

Understand How to Use and Develop Meshfree Techniques An Update of a Groundbreaking Work Reflecting the significant advances made in the field since the publication of its predecessor, Meshfree Methods: Moving Beyond the Finite Element Method, Second Edition systematically covers the most widely used meshfree methods. With 70% new material, this edition addresses important new developments, especially on essential theoretical issues. New to the Second Edition Much more details on fundamental concepts and important theories for numerical methods Discussions on special properties of meshfree methods, including stability, convergence, accurate, efficiency, and bound property More detailed discussion on error estimation and adaptive analysis using meshfree methods Developments on combined meshfree/finite element method (FEM) models Comparison studies using meshfree and FEM Drawing on the author’s own research, this book provides a single-source guide to meshfree techniques and theories that can effectively handle a variety of complex engineering problems. It analyzes how the methods work, explains how to use and develop the methods, and explores the problems associated with meshfree methods. To access MFree2D (copyright, G. R. Liu), which accompanies MESHFREE METHODS: MOVING BEYOND THE FINITE ELEMENT METHOD, Second Edition (978-1-4200-8209-8) by Dr. G. R. Liu, please go to the website: www.ase.uc.edu/~liugr An access code is needed to use program – to receive it please email Dr. Liu directly at: liugr@ucmail.uc.edu Dr. Liu will reply to you directly with the code, and you can then proceed to use the software.

Extended Finite Element and Meshfree Methods

Proceedings of the U.S.?Japan Seminar on Post-Peak Behavior of Reinforced Concrete Structures Subjected to Seismic Loads: Recent Advances and Challenges on Analysis and Design, held in Tokyo and Lake Yamanaka, Japan, October 25-29,

1999. Sponsored by the National Science Foundation, U.S.A.; Japan Society for the Promotion of Science; Japan Concrete Institute. This collection presents the latest ideas and findings on the inelastic behavior of reinforced concrete (RC) structures from the analysis and design standpoints. These papers discuss state-of-the-art concrete material models and analysis methods that can be used to simulate and understand the inelastic behavior of RC structures, as well as design issues that can improve the seismic performance of these structures. Topics include modeling of concrete behavior; modeling of RC structures (finite element approach and macro-element approach); and experimental studies, analysis, and design issues.