

Geotechnical Engineering Reza S Ashtiani

The safety of civilians is of paramount importance during the construction and repair of concrete pavements. A complete understanding of the pavement distresses that compromise the structural stability and performance of rigid pavements are required for a proper selection of the repair method. Additionally, the time required to complete the repair process should be minimized to reduce the delay imposed on the users of the transportation facilities. The US Air Force Research Laboratory (AFRL) in association with the Air Force Civil Engineering Support Agency (AFCESA) developed a state of practice protocol for the repair of damaged runways using precast concrete slabs. The current study tends to extrapolate the previous research on this topic to civilian highway pavements. In the AFRL study, three installation techniques, widely used by the transportation industry, were incorporated in the experiment design. The original study did not consider the influence of temperature fluctuations, humidity and the stresses induced by environmental conditions for the performance evaluation of the precast slabs. This study tends to capture the influence of the climatic conditions on the orthogonal load bearing capacity of repaired sections.

The aggregate base layer is a vital part of the flexible pavement system. Unlike rigid pavements, the base layer provides a substantial contribution to the load bearing capacity in flexible pavements, and this contribution is complex: stress dependent, moisture dependent, particle size dependent, and is anisotropic in nature. Furthermore, the response of the aggregate layer in the pavement structure is defined not only by resilient properties of the base layer but also by permanent deformation properties of the aggregate layer. Before the benefits of revolutionary changes in the typical pavement structures, such as deep unbound aggregate base (UAB) layers under thin hot mix asphalt surfaces and inverted pavement systems can be justified, an accurate assessment of the UAB is required. Several researchers identified that in order to properly assess the contribution of the UAB in the pavement structure, it is necessary to consider not only the vertical modulus but also the horizontal modulus as this substantially impacts the distribution of stresses within the pavement structure. Anisotropy, which is defined as the directional dependency of the material properties in unbound granular bases, is inherent even before the aggregate layer is subjected to traffic loads due to random arrangement of particles upon compaction. Distribution of particle contacts is dominated by the geometry of the aggregates as well as the compaction effort at the time of construction. Critical pavement responses and therefore performance of flexible pavements are significantly influenced by the level of anisotropy of aggregate layers. There are several ways to characterize the level of anisotropy in unbound aggregate systems. Previous research at Texas A & M University suggests functions of fitting parameters in material models (k values) as characterizers of the level of anisotropy. In the realm of geotechnical engineering, the ratio of the horizontal modulus to vertical modulus is commonly referred to as the level of anisotropy. When the vertical and horizontal moduli are equal, the system is isotropic, but when they differ, the system is anisotropic. This research showed that the level of anisotropy can vary considerably depending on aggregate mix properties such as gradation, saturation level, and the geometry of the aggregate particles. Cross anisotropic material properties for several unbound and stabilized aggregate systems were determined. A comprehensive aggregate database was developed to identify the contribution level of aggregate features to the directional dependency of material properties. Finally a new mechanistic performance protocol based on plasticity theory was developed to ensure the stability of the pavement foundations under traffic loads.

Innovations in Road, Railway and Airfield Bearing Capacity – Volume 1 comprises the first part of contributions to the 11th International

Conference on Bearing Capacity of Roads, Railways and Airfields (2022). In anticipation of the event, it unveils state-of-the-art information and research on the latest policies, traffic loading measurements, in-situ measurements and condition surveys, functional testing, deflection measurement evaluation, structural performance prediction for pavements and tracks, new construction and rehabilitation design systems, frost affected areas, drainage and environmental effects, reinforcement, traditional and recycled materials, full scale testing and on case histories of road, railways and airfields. This edited work is intended for a global audience of road, railway and airfield engineers, researchers and consultants, as well as building and maintenance companies looking to further upgrade their practices in the field.

During the last two decades rock mechanics in Europe has been undergoing some major transformation. The reduction of mining activities in Europe affects heavily on rock mechanics teaching and research at universities and institutes. At the same time, new emerging activities, notably, underground infrastructure construction, geothermal energy develop

This volume presents selected papers presented during the 4th International Conference on Transportation Geotechnics (ICTG). The papers address the geotechnical challenges in design, construction, maintenance, monitoring, and upgrading of roads, railways, airfields, and harbor facilities and other ground transportation infrastructure with the goal of providing safe, economic, environmental, reliable and sustainable infrastructures. This volume will be of interest to postgraduate students, academics, researchers, and consultants working in the field of civil and transport infrastructure. .

This work presents the lecture notes of the 1994 Mechanics of Porous Media Summer School. Chapters cover theoretical basics, methods for measuring poroelastic coefficients, numerical implementation and applications.

This book deals with the concept of post-Islamism from a mainly philosophical perspective, using political liberalism as elaborated by John Rawls as the key interpretive tool. What distinguishes this book from most scholarship in Iranian studies is that it primarily deals with the projects of Iranian intellectuals from a normative perspective as the concept is understood by analytical philosophers. The volume includes analyses of the strengths and weakness of the arguments underlying each thinker's ideas, rather than looking for their historical and sociological origins, genealogy, etc. Each chapter develops a particular conjectural argument for the possibility of an overlapping consensus between Islam and political liberalism, though the arguments presented draw upon different Islamic, particularly Shia, resources. Thus, while Shabestari and Soroush primarily reason from a modernist theological or kalami perspective, M.H.Tabatabai and Mehdi Haeri Yazdi's arguments are mainly based on traditional Islamic philosophy and Quranic exegesis. While Kadivar, An-Naim and Fanaei are post-Islamist in the exact sense of the term, Malekian goes beyond typical post-Islamism by proposing a theory for spirituality that constrains religion within the boundaries of enlightenment thought. Throughout the book, specific attention is given to Ferrara and March's readings of political liberalism. Although the book's chapters constitute a whole, they can also be read independently if the reader is only curious about particular intellectuals whose political theories are discussed.

Environmental Impacts of Mining is a comprehensive reference addressing some of the most significant environmental problems associated with mining. These issues include destruction of landscapes, destruction of agricultural and forest lands, sedimentation and erosion, soil contamination, surface and groundwater pollution, air pollution, and waste management. The book presents an agenda for minimizing environmental damage and offers solutions for the restoration and remediation of degraded areas. This book is a "must have" for environmental consultants, regulators, planners, workers in the mining industry, geologists, hydrologists, hazardous waste professionals, and instructors in the environmental sciences.

This book is a collection of extended papers based on presentations given during the ICEC 2018 conference, held in Caen, France, in August 2018. It explores both the limitations and advantages of current models, and highlights the latest developments concerning new numerical schemes, high-performance computing, multi-physics and multi-scale methods, and better interaction with field or scale model data. Accordingly, it addresses the interests of practitioners, stakeholders, researchers, and engineers active in this field.

In the history of mankind, three revolutions which impact the human life are the tool-making revolution, agricultural revolution and industrial revolution. They have transformed not only the economy and civilization but the overall development of the society. Probably, intelligence revolution is the next revolution, which the society will perceive in the next 10 years. ICCD-2014 covers all dimensions of intelligent sciences, i.e. Intelligent Computing, Intelligent Communication and Intelligent Devices. This volume covers contributions from Intelligent Communication which are from the areas such as Communications and Wireless Ad Hoc & Sensor Networks, Speech & Natural Language Processing, including Signal, Image and Video Processing and Mobile broadband and Optical networks, which are the key to the ground-breaking inventions to intelligent communication technologies. Secondly, Intelligent Device is any type of equipment, instrument or machine that has its own computing capability. Contributions from the areas such as Embedded Systems, RFID, RF MEMS, VLSI Design & Electronic Devices, Analog and Mixed-Signal IC Design and Testing, MEMS and Microsystems, CMOS MEMS, Solar Cells and Photonics, Nano Devices, Single Electron & Spintronics Devices, Space Electronics and Intelligent Robotics are covered in this volume.

Despite the mechanisms of reservoir sedimentation being well known for a long time, sustainable and preventive measures are rarely taken into consideration in the design of new reservoirs. To avoid operational problems of powerhouses, sedimentation is often treated for existing reservoirs with measures which are efficient only for a limited time. Th

This book is an up-to-date review of research and practice on the use of vegetation for slope stabilization and control of surface erosion caused by water and wind. From a basic understanding of the principles and practices of vegetation growth and establishment, it describes how vegetation can be treated as an engineering material and used to solve erosion and slope stability problems.

This book examines attempts to influence the outcome of the negotiations between Iran and the United States over Iran's nuclear capabilities. In particular, it focuses on struggles within the United States around public and congressional opinion with regard to the accord. Trying to prevent a successful outcome to the talks became a cottage industry in Washington, with the casino billionaire Sheldon Adelson being just one of those who were pouring millions of dollars into

the effort. On the pro-diplomacy side, there were a wide range of religious, peace, and arms control groups with some financial support coming from the Ploughshares Fund trying to create the space for a negotiated agreement. The tactics of both sides of the debate are described and analyzed to show how a contentious foreign policy issue can become not just a decision for high-level government decision makers, but a wide-ranging fight that involves scores of nongovernmental organizations, the media, and thousands of activists.

Human Rights Watch is increasingly recognized as the world's leader in building a stronger awareness for human rights. Their annual World Report is the most probing review of human rights developments available anywhere. Written in straightforward, non-technical language, Human Rights Watch World Report prioritizes events in the most affected countries during the previous year. The backbone of the report consists of a series of concise overviews of the most pressing human rights issues in countries from Afghanistan to Zimbabwe, with particular focus on the role—positive or negative—played in each country by key domestic and international figures. Highly anticipated and widely publicized by the U.S. and international press every year, the World Report is an invaluable resource for journalists, diplomats, and all citizens of the world.

This book constitutes the refereed proceedings of the 20th International TRIZ Future Conference on Automated Invention for Smart Industries, TFC 2020, held in Cluj-Napoca, Romania, in October 2020 and sponsored by IFIP WG 5.4. The conference was held virtually. The 34 full papers presented were carefully reviewed and selected from 91 submissions. They are organized in the following thematic sections: computing TRIZ; education and pedagogy; sustainable development; tools and techniques of TRIZ for enhancing design; TRIZ and system engineering; TRIZ and complexity; and cross-fertilization of TRIZ for innovation management.

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Modelling has permeated virtually all areas of industrial, environmental, economic, bio-medical or civil engineering: yet the use of models for decision-making raises a number of issues to which this book is dedicated: How uncertain is my model ? Is it truly valuable to support decision-making ? What kind of decision can be truly supported and how can I handle residual uncertainty ? How much refined should the mathematical description be, given the true data limitations ? Could the uncertainty be reduced through more data, increased modeling investment or computational budget ? Should it

be reduced now or later ? How robust is the analysis or the computational methods involved ? Should / could those methods be more robust ? Does it make sense to handle uncertainty, risk, lack of knowledge, variability or errors altogether ? How reasonable is the choice of probabilistic modeling for rare events ? How rare are the events to be considered ? How far does it make sense to handle extreme events and elaborate confidence figures ? Can I take advantage of expert / phenomenological knowledge to tighten the probabilistic figures ? Are there connex domains that could provide models or inspiration for my problem ? Written by a leader at the crossroads of industry, academia and engineering, and based on decades of multi-disciplinary field experience, *Modelling Under Risk and Uncertainty* gives a self-consistent introduction to the methods involved by any type of modeling development acknowledging the inevitable uncertainty and associated risks. It goes beyond the “black-box” view that some analysts, modelers, risk experts or statisticians develop on the underlying phenomenology of the environmental or industrial processes, without valuing enough their physical properties and inner modelling potential nor challenging the practical plausibility of mathematical hypotheses; conversely it is also to attract environmental or engineering modellers to better handle model confidence issues through finer statistical and risk analysis material taking advantage of advanced scientific computing, to face new regulations departing from deterministic design or support robust decision-making. *Modelling Under Risk and Uncertainty*: Addresses a concern of growing interest for large industries, environmentalists or analysts: robust modeling for decision-making in complex systems. Gives new insights into the peculiar mathematical and computational challenges generated by recent industrial safety or environmental control analysis for rare events. Implements decision theory choices differentiating or aggregating the dimensions of risk/aleatory and epistemic uncertainty through a consistent multi-disciplinary set of statistical estimation, physical modelling, robust computation and risk analysis. Provides an original review of the advanced inverse probabilistic approaches for model identification, calibration or data assimilation, key to digest fast-growing multi-physical data acquisition. Illustrated with one favourite pedagogical example crossing natural risk, engineering and economics, developed throughout the book to facilitate the reading and understanding. Supports Master/PhD-level course as well as advanced tutorials for professional training Analysts and researchers in numerical modeling, applied statistics, scientific computing, reliability, advanced engineering, natural risk or environmental science will benefit from this book.

Contents: (1) Background of the Iran Sanctions Act (ISA): Key Provisions: ¿Triggers¿ and Available Sanctions; Waiver and Termination Authority; Iran Freedom Support Act Amendments; Effectiveness and Ongoing Challenges: Energy Routes and Refinery Investment: Refinery Construction; Significant Purchase Agreements; Efforts in the 110th and 111th Congress to Expand ISA Application; Other Energy-Related Sanctions Ideas; (2) Relationships to Other U.S. Sanctions:

Ban on U.S. Trade and Investment With Iran; Treasury Department ¿ Targeted Financial Measures¿; Terrorism-Related Sanctions; Executive Order 13224; Proliferation-Related Sanctions; Efforts to Promote Divestment; Blocked Iranian Property and Assets. Tables.

Mirsepassi uses interviews with thirteen individuals to relate the colourful life and times of Ahmad Fardid and his intellectual legacy.

Cement-treated base (CTB) is a general term that applies to an mixture of native soils and/or manufactured aggregates with measured amounts of portland cement and water that is compacted and cured to form a strong, durable, frost resistant paving material. Other descriptions such as soil-cement base, cement-treated aggregate base, cement-stabilized base are sometimes used. This document provides a basic guide on the use of cement-treated base (CTB) for pavement applications. This document provides an overview on the design and construction of CTB for both mixed-in-place and central plant mixed operations. A suggested construction specification is also included.

In today's digital age, online and mobile advertising are of growing importance, with advertising no longer bound to the traditional media industry. Although the advertising industry still has broader access to the different measures and channels, users and consumers today have more possibilities to publish, get informed or communicate – to “co-create” –, and to reach a bigger audience. There is a good chance thus that users and consumers are better informed about the objectives and persuasive tricks of the advertising industry than ever before. At the same time, advertisers can inform about products and services without the limitations of time and place faced by traditional mass media. But will there really be a time when advertisers and consumers have equal power, or does tracking users online and offline lead to a situation where advertisers have more information about the consumers than ever before? The volume discusses these questions and related issues.

A fresh look at Iranian popular culture and women's role within this prior to the 1979 Revolution.

Advances in Materials and Pavement Performance Prediction contains the papers presented at the International Conference on Advances in Materials and Pavement Performance Prediction (AM3P, Doha, Qatar, 16- 18 April 2018). There has been an increasing emphasis internationally in the design and construction of sustainable pavement systems. Advances in Materials and Pavement Prediction reflects this development highlighting various approaches to predict pavement performance. The contributions discuss links and interactions between material characterization methods, empirical predictions, mechanistic modeling, and statistically-sound calibration and validation methods. There is also emphasis on comparisons between modeling results and observed performance. The topics of the book include (but are not limited to): • Experimental laboratory material characterization • Field measurements and in situ material

characterization • Constitutive modeling and simulation • Innovative pavement materials and interface systems • Non-destructive measurement techniques • Surface characterization, tire-surface interaction, pavement noise • Pavement rehabilitation • Case studies Advances in Materials and Pavement Performance Prediction will be of interest to academics and engineers involved in pavement engineering.

This book includes a collection of research and practical papers aiming with key priority for improving the infrastructural sustainability for our well-being and day-to-day lives through novel developments. The united efforts through new developments in material, design, construction, maintenance, and testing of pavements from all over the world are taken under one umbrella. Topics include issues related to civil infrastructure such as the use of construction waste, recycled aggregates, service life prediction of pavements, mechanical behavior of SMA, control measures of ready mixed concrete, determination of landslide high-risk areas, Simulation of rock hydraulics in rock joint, sustainable planning for provision of basic infrastructural facilities in rural areas. It is anticipated that this book will support decisions regarding the optimal management and maintenance of civil infrastructures to support a more resilient and sustainable environment for infrastructure users.

The Amnesty International Report 2012 documents the state of human rights in 155 countries and territories in 2011. Throughout the year the demand for human rights resounded around the globe. The year began with protests in countries where freedom of expression and freedom of assembly were routinely repressed. But by the end of the year, discontent and outrage at the failure of governments to ensure justice, security and human dignity had ignited protests across the world. A common strand linking these protests, whether in Cairo or New York, was how quick governments were to prevent peaceful protest and silence dissent. Those who took to the streets displayed immense courage in the face of often brutal crackdowns and overwhelming use of lethal force. In a year of unrest, transition and conflict, too many people are still denied their most basic rights. As demands for better governance and respect for human rights grow, this report shows that world leaders have yet to rise to the challenge.

This text presents a modern theory of analysis, control, and optimization for dynamic networks. Mathematical techniques of Lyapunov drift and Lyapunov optimization are developed and shown to enable constrained optimization of time averages in general stochastic systems. The focus is on communication and queueing systems, including wireless networks with time-varying channels, mobility, and randomly arriving traffic. A simple drift-plus-penalty framework is used to optimize time averages such as throughput, throughput-utility, power, and distortion. Explicit performance-delay tradeoffs are provided to illustrate the cost of approaching optimality. This theory is also applicable to problems in operations research and economics, where energy-efficient and profit-maximizing decisions must be made without knowing the future. Topics in the text include the following: - Queue stability theory - Backpressure, max-weight, and virtual queue methods - Primal-dual methods for non-convex stochastic utility maximization - Universal scheduling theory for arbitrary sample paths - Approximate and randomized scheduling theory - Optimization of renewal systems and Markov decision systems Detailed examples and numerous problem set questions are provided to reinforce the main concepts. Table of Contents: Introduction / Introduction to Queues / Dynamic Scheduling Example / Optimizing Time

Averages / Optimizing Functions of Time Averages / Approximate Scheduling / Optimization of Renewal Systems / Conclusions

Unbound Aggregates in Roads contains the proceedings of the International Symposium on Unbound Aggregates in Roads (UNBAR3) held at the University of Nottingham, England, on April 11-13, 1989. The papers focus on unbound aggregates used in road construction and cover topics ranging from drainage and permeability to placement and compaction of unbound aggregates, design philosophy, specification, and compliance. This book consists of 49 chapters divided into eight sections and opens with an overview of the functions of unbound aggregates in roads, followed by a discussion on the mechanical properties of different aggregates and theoretical aspects of granular materials. The following chapters focus on granular drainage layers in pavement foundations; residual stresses caused by compaction in granular materials; and alternative materials for road construction such as steel slags and natural and waste materials. The use of unbound road aggregates in various countries such as Italy, France, Germany, and Portugal is also considered. This monograph will be a useful resource for designers, aggregate producers, contractors, specification writers, and materials engineers.

Pavement Design And Paving Material Selection are important for efficient, cost effective, durable, and safe transportation infrastructure Paving Materials and Pavement Analysis contains 73 papers examining bound and unbound material characterization, modeling, and performance of highway and airfield pavements. The papers in this publication were presented during the GeoShanghai 2010 International Conference held in Shanghai, China, June 3-5, 2010.

Inspired from the legacy of the previous four 3DFEM conferences held in Delft and Athens as well as the successful 2018 AM3P conference held in Doha, the 2020 AM3P conference continues the pavement mechanics theme including pavement models, experimental methods to estimate model parameters, and their implementation in predicting pavement performance. The AM3P conference is organized by the Standing International Advisory Committee (SIAC), at the time of this publication chaired by Professors Tom Scarpas, Eyad Masad, and Amit Bhasin. Advances in Materials and Pavement Performance Prediction II includes over 111 papers presented at the 2020 AM3P Conference. The technical topics covered include: - rigid pavements - pavement geotechnics - statistical and data tools in pavement engineering - pavement structures - asphalt mixtures - asphalt binders The book will be invaluable to academics and engineers involved or interested in pavement engineering, pavement models, experimental methods to estimate model parameters, and their implementation in predicting pavement performance.

Searing verses set on the Mexican border about war and addiction, love and sexual violence, grief and loss, from an American Book Award-winning author. Selected by Gregory Pardlo as winner of the National Poetry Series. El Paso is one of the safest cities in the United States, while across the river, Ciudad Juárez suffers a history of femicides and a horrific drug war. Witnessing this, a Filipina's life unravels as she tries to love an addict, the murders growing just a city—but the breadth of a country—away. This collection weaves the personal with recent history, the domestic with the tragic, asking how much “a body will hold,” reaching from the border to the poet's own Philippines. These poems thirst in the desert, want for water, searching the brutal and tender territories between bodies, families, and nations.

This book focuses on oil politics and the development of nuclear technology in Iran, providing a broader historical context to understand Iran's foreign relations and nuclear policy. The author assesses Iran's encounters with the West in light of major confrontations both in terms of open conflict as well as controversies surrounding treaties with foreign powers. In seeking to understand the geopolitics of oil in direct parallel to the geopolitics of nuclear technology, the book concentrates on Iran's struggles to nationalize its oil, neo-colonialism, the formation of the oil consortium, and the more recent US backtracking on the nuclear deal with Iran.

Using a 'Historical Institutional' approach, this book sheds light on a relatively understudied dimension of state-building in early twentieth century Iran, namely the quest for judicial reform and the rule of law from the 1906 Constitutional Revolution to the end of Reza Shah's rule in 1941.

Moving Particle Semi-implicit Method: A Meshfree Particle Method for Fluid Dynamics begins by familiarizing the reader with basic theory that supports their journey through sections on advanced MPH methods. The unique insights that this method provides include fluid-structure interaction, non-Newtonian flow, and cavitation, making it relevant to a wide range of applications in the mechanical, structural, and nuclear industries, and in bioengineering. Co-authored by the originator of the MPS method, this book is the most authoritative guide available. It will be of great value to students, academics and researchers in industry. Presents the differences between MPH and SPH, helping readers choose between methods for different purposes Provides pieces of computer code that readers can use in their own simulations Includes the full, extended algorithms Explores the use of MPS in a range of industries and applications, including practical advice

Coastal aquifers serve as major sources for freshwater supply in many countries around the world, especially in arid and semi-arid zones. Many coastal areas are also heavily urbanized, a fact that makes the need for freshwater even more acute. Coastal aquifers are highly sensitive to disturbances. Inappropriate management of a coastal aquifer may lead to its destruction as a source for freshwater much earlier than other aquifers which are not connected to the sea. The reason is the threat of seawater intrusion. In many coastal aquifers, intrusion of seawater has become one of the major constraints imposed on groundwater utilization. As sea water intrusion progresses, existing pumping wells, especially those close to the coast, become saline and have to be abandoned. Also, the area above the intruding seawater wedge is lost as a source of natural replenishment to the aquifer. Despite the importance of this subject, so far there does not exist a book that integrates our present knowledge of seawater intrusion, its occurrences, physical mechanism, chemistry, exploration by geo physical and geochemical techniques, conceptual and mathematical modeling, analytical and numerical solution methods, engineering measures of combating seawater intrusion, management strategies, and experience learned from case studies. By presenting this fairly comprehensive volume on the state-of-the-art of knowledge and ex perience on saltwater intrusion, we hoped to transfer this body of knowledge to the geologists, hydrologists, hydraulic engineers, water resources planners, managers, and governmental policy makers, who are engaged in the sustainable development of coastal fresh ground water resources.

Infrastructure Sustainability Through New Developments in Material, Design, Construction, Maintenance, and Testing of Pavements Proceedings of the 6th GeoChina International Conference on Civil & Transportation Infrastructures: From Engineering to Smart & Green Life Cycle Solutions -- Nanchang, China, 2021 Springer Nature

The proceedings of the 2013 Airfield & Highway Pavement Conference: Sustainable and Efficient Pavements, held in Los Angeles, California, June 9-12, 2013 contains 123 peer-reviewed papers that focus on the latest developments and cutting-edge technological improvements in pavements and pavement sustainability. Topics include: advanced modeling, design, and analysis of pavements; construction and rehabilitation techniques; asphalt characterization and testing; recycling materials in pavements; pavement quality control/quality assurance; pavement sustainability and life-cycle assessment; nondestructive testing and evaluation; pavement management systems; and airfield and pavement case studies. This proceedings will be of interest to researchers, designers, project/construction managers, and contractors.

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