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Analytical Methods in Petroleum Upstream Applications - Cesar Ovalles

2015-04-02

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.

Rail Infrastructure

Resilience - Rui Calçada
2022-06-30

Economic growth, security and sustainability across Europe are at risk due to ageing railway infrastructure systems. At present, the majority of such systems are aging and some have even reached their initial design lives. These issues align with a major challenge in civil engineering: how to restore and improve urban infrastructure and built environments. Policy, environmental and physical barriers must be addressed and overcome. The complex and interconnected nature of the problem means that there is a need for academia, industry, communities and governments to work collaboratively. The challenges posed by extreme events from natural and man-made disasters are urgent. Rail Infrastructure Resilience: A Best-Practices Handbook presents developed improvement methods for rail infrastructure systems, toward resilience to extreme

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conditions. It shows how best to use new information in the engineering design, maintenance, construction and renewal of rail infrastructure resilience, through knowledge exchange and capability development. The book presents the outcome of a major European research project, known as the RISEN project. RISEN aimed to enhance knowledge creation and transfer using both international and intersectoral secondment mechanisms among European Advanced Rail Research Universities and SMEs, and Non-EU, leading rail universities, providing methodological approaches and practical tools for restoring and improving railway infrastructure systems for extreme events. Edited and written by members of this project, this book will be essential reading for researchers and practitioners hoping to find practical solutions to the challenges of rail infrastructure resilience. Offers a best-practices handbook for rail

infrastructure resilience from the leaders in the field Paints a holistic picture of the rail transport system, showing that infrastructure maintenance intervention can be enhanced through advanced monitoring systems and resilience design Presents rail infrastructure resilience and advanced condition monitoring, allowing a better understanding of the critical maintenance, renewal and retrofit needs of railways Considers how academia, industry, communities and governments can work collaboratively in order to tackle aggregated problems in rail infrastructure resilience Presents the findings from the RISEN project, the leading European project on enhancing knowledge creation and transfer of expertise on rail infrastructure resilience *Transport Infrastructure and Systems - Gianluca Dell'Acqua* 2017-03-16 Transport Infrastructure Asset management in transport infrastructure, financial viability of transport engineering projects/ Life cycle

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Cost Analysis, Life-Cycle Assessment and Sustainability Assessment of transport infrastructure/ Infrastructures financing and pricing with equity appraisal, operation optimization and energy management/ Low-Volume roads: planning, maintenance, operations, environmental and social issues/ Public-Private Partnership (PPP) experience in transport infrastructure in different countries and economic conditions/ Airport Pavement Management Systems, runway design and maintenance/ Port maintenance and development issues, technology relating to cargo handling, landside access, cruise operations/ Infrastructure Building Information Modelling (I-BIM) / Pavement design and innovative bituminous materials/ Recycling and re-use in road pavements, environmentally sustainable technologies/ Stone pavements, ancient roads and historic railways/ Cementitious stabilization of materials used in the rehabilitation of

transportation infrastructure. Transport Systems Sustainable transport and the environment protection including green vehicles/ Urban transport, land use development, spatial and transport planning/ Bicycling, bike, bike-sharing systems, cycling mobility/ Human factor in transport systems/ Intelligent Mobility: emerging technologies to enable the smarter movement of people and goods/Airport landside: access roads, parking facilities, terminal facilities, aircraft apron and the adjacent taxiway/ Transportation policy, planning and design, modelling and decision making/ Transport economics, finance and pricing issues, optimization problems, equity appraisal/ Road safety impact assessments, road safety audits, the management of road network safety and safety inspections/ Tunnels and underground structures: preventing incidents-accidents mitigating their effects for both people and goods/ Traffic flow characteristics, traffic control devices, work zone traffic control, highway capacity and

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quality of service/ Track-vehicle interactions in railway systems, capacity analysis of railway networks/ Risk assessment and safety in air and railway transport, reliability aspects/ Maritime transport and inland waterways transport research/ Intermodal freight transport: terminals and logistics.

Dynamics of Vehicles on Roads and Tracks Vol 2 -

Maksym Spiryagin 2017-12-06
The International Symposium on Dynamics of Vehicles on Roads and Tracks is the leading international gathering of scientists and engineers from academia and industry in the field of ground vehicle dynamics to present and exchange their latest innovations and breakthroughs. Established in Vienna in 1977, the International Association of Vehicle System Dynamics (IAVSD) has since held its biennial symposia throughout Europe and in the USA, Canada, Japan, South Africa and China. The main objectives of IAVSD are to promote the development of the science of

vehicle dynamics and to encourage engineering applications of this field of science, to inform scientists and engineers on the current state-of-the-art in the field of vehicle dynamics and to broaden contacts among persons and organisations of the various countries engaged in scientific research and development in the field of vehicle dynamics and related areas. IAVSD 2017, the 25th Symposium of the International Association of Vehicle System Dynamics was hosted by the Centre for Railway Engineering at Central Queensland University, Rockhampton, Australia in August 2017. The symposium focused on the following topics related to road and rail vehicles and trains: dynamics and stability; vibration and comfort; suspension; steering; traction and braking; active safety systems; advanced driver assistance systems; autonomous road and rail vehicles; adhesion and friction; wheel-rail contact; tyre-road interaction; aerodynamics and

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crosswind; pantograph-catenary dynamics; modelling and simulation; driver-vehicle interaction; field and laboratory testing; vehicle control and mechatronics; performance and optimization; instrumentation and condition monitoring; and environmental considerations. Providing a comprehensive review of the latest innovative developments and practical applications in road and rail vehicle dynamics, the 213 papers now published in these proceedings will contribute greatly to a better understanding of related problems and will serve as a reference for researchers and engineers active in this specialised field. Volume 2 contains 135 papers under the subject heading Rail.

Geotechnical Engineering Handbook - Braja M. Das 2011
The Geotechnical Engineering Handbook brings together essential information related to the evaluation of engineering properties of soils, design of foundations such as spread footings, mat foundations, piles, and drilled shafts, and

fundamental principles of analyzing the stability of slopes and embankments, retaining walls, and other earth-retaining structures. The Handbook also covers soil dynamics and foundation vibration to analyze the behavior of foundations subjected to cyclic vertical, sliding and rocking excitations and topics addressed in some detail include: environmental geotechnology and foundations for railroad beds.

European Workshop on Structural Health

Monitoring - Piervincenzo Rizzo 2022-06-15

This volume gathers the latest advances, innovations, and applications in the field of structural health monitoring (SHM) and more broadly in the fields of smart materials and intelligent systems, as presented by leading international researchers and engineers at the 10th European Workshop on Structural Health Monitoring (EWSHM), held in Palermo, Italy on July 4-7, 2022. The volume covers highly diverse topics, including signal processing, smart sensors,

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autonomous systems, remote sensing and support, UAV platforms for SHM, Internet of Things, Industry 4.0, and SHM for civil structures and infrastructures. The contributions, which are published after a rigorous international peer-review process, highlight numerous exciting ideas that will spur novel research directions and foster multidisciplinary collaboration among different specialists.

Afro-European Conference for Industrial Advancement - Ajith Abraham 2014-11-18

This volume contains accepted papers presented at AECIA2014, the First International Afro-European Conference for Industrial Advancement. The aim of AECIA was to bring together the foremost experts as well as excellent young researchers from Africa, Europe, and the rest of the world to disseminate latest results from various fields of engineering, information, and communication technologies. The first edition of AECIA was

organized jointly by Addis Ababa Institute of Technology, Addis Ababa University, and VSB - Technical University of Ostrava, Czech Republic and took place in Ethiopia's capital, Addis Ababa.

Railway Transportation Systems - Christos N. Pyrgidis 2016-04-21

Incorporates More Than 25 Years of Research and Experience Railway Transportation Systems: Design, Construction and Operation presents a comprehensive overview of railway passenger and freight transport systems, from design through to construction and operation. It covers the range of railway passenger systems, from conventional and high speed inter

New Research on Acoustics - Benjamin N. Weiss 2008
Acoustics is the science concerned with the production, control, transmission, reception, and effects of sound. Its origins began with the study of mechanical vibrations and the radiation of these vibrations through mechanical

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waves, and still continue today. Research was done to look into the many aspects of the fundamental physical processes involved in waves and sound and into possible applications of these processes in modern life. The study of sound waves also leads to physical principles that can be applied to the study of all waves. The broad scope of acoustics as an area of interest and endeavour can be ascribed to a variety of reasons. First, there is the ubiquitous nature of mechanical radiation, generated by natural causes and by human activity. Then, there is the existence of the sensation of hearing, of the human vocal ability, of communication via sound, along with the variety of psychological influences sound has on those who hear it. Such areas as speech, music, sound recording and reproduction.

Rail Quality and Maintenance for Modern Railway Operation - J.J.

Kalker 2013-04-18

In April 1990 a conference was held at the Cracow Institute of

Technology, Cracow, Poland.

The title of that conference was "Residual Stresses in Rails - Effects on Rail Integrity and Railroad Economics" and its themes were the measurement and prediction of residual stresses in rails, but, as the sub-title suggests, the intention was also to provide a link between research and its application to the practical railway world. At the Cracow conference there were 40 participants with 5 railways and 5 rail makers being represented and 25 papers were given. The Cracow conference was a success, and by March 1991 its off-spring, "The International Conference on Rail Quality and Maintenance for Modern Railway Operations", was conceived and birth was ultimately given in June 1992 at the Technical University, Delft. It turned out to be some baby, with 112 delegates from 24 countries taking part! As with its predecessor, the conference was to provide a forum for the exchange of ideas between research

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investigators, rail makers and railway engineers. A cursory examination of the list of participants suggests that about 57% were from the railway industry, 34% from universities and other research institutions and 9% from the steel industry. Bearing in mind that some of the railway industry participants were from their respective research and development organisations the balance of interests was about right.

International Congress and Workshop on Industrial AI 2021 - Ramin Karim
2022-02-07

This proceedings of the International Congress and Workshop on Industrial AI 2021 encompasses and integrates the themes and topics of three conferences, eMaintenance, Condition Monitoring and Diagnostic Engineering management (COMADEM), and Advances in Reliability, Maintainability and Supportability (ARMS) into a single resource. The 21st century is witnessing the emerging extensive

applications of Artificial Intelligence (AI) and Information Technologies (IT) in industry. Industrial Artificial Intelligence (IAI) integrates IT with Operational Technologies (OT) and Engineering Technologies (ET) to achieve operational excellence through enhanced analytics in operation and maintenance of industrial assets. This volume provides insight into opportunities and challenges caused by the implementation of AI in industries apart from future developments with special reference to operation and maintenance of industrial assets. Industry practitioners in the maintenance field as well as academics seeking applied research in maintenance will find this text useful.

Railway Track Engineering - J. S. Mundrey 2009-10-29
Railway Track Engineering presents conventional methods of track construction, maintenance and monitoring, along with modern sophisticated track machines. It also comprehensively covers design details and

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specifications of important track components. Changes in the revised edition include: Explanation of the hitherto little understood phenomenon of rolling contact fatigue in rails and practical steps to deal with it. New technology of alumino-thermic rail welding. New guidelines for ultrasonic rail flaw detection. Ballastless track for metros, mainlines and washable aprons. Track standards for ultra high-speed lines in India. Track structure for Dedicated Freight Corridors. Technology of fully mechanized track construction with the deployment of simple track laying equipment to highly sophisticated track-laying trains. Richly illustrated with photographs and line drawings, this book will be useful to professionals and students.

Big Data and Differential Privacy - Nii O. Attoh-Okine
2017-05-22

A comprehensive introduction to the theory and practice of contemporary data science analysis for railway track

engineering. Featuring a practical introduction to state-of-the-art data analysis for railway track engineering, Big Data and Differential Privacy: Analysis Strategies for Railway Track Engineering addresses common issues with the implementation of big data applications while exploring the limitations, advantages, and disadvantages of more conventional methods. In addition, the book provides a unifying approach to analyzing large volumes of data in railway track engineering using an array of proven methods and software technologies. Dr. Attoh-Okine considers some of today's most notable applications and implementations and highlights when a particular method or algorithm is most appropriate. Throughout, the book presents numerous real-world examples to illustrate the latest railway engineering big data applications of predictive analytics, such as the Union Pacific Railroad's use of big data to reduce train derailments, increase the

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velocity of shipments, and reduce emissions. In addition to providing an overview of the latest software tools used to analyze the large amount of data obtained by railways, *Big Data and Differential Privacy: Analysis Strategies for Railway Track Engineering*: • Features a unified framework for handling large volumes of data in railway track engineering using predictive analytics, machine learning, and data mining • Explores issues of big data and differential privacy and discusses the various advantages and disadvantages of more conventional data analysis techniques • Implements big data applications while addressing common issues in railway track maintenance • Explores the advantages and pitfalls of data analysis software such as R and Spark, as well as the Apache™ Hadoop® data collection database and its popular implementation MapReduce *Big Data and Differential Privacy* is a valuable resource for researchers and professionals

in transportation science, railway track engineering, design engineering, operations research, and railway planning and management. The book is also appropriate for graduate courses on data analysis and data mining, transportation science, operations research, and infrastructure management. NII ATTOH-OKINE, PhD, PE is Professor in the Department of Civil and Environmental Engineering at the University of Delaware. The author of over 70 journal articles, his main areas of research include big data and data science; computational intelligence; graphical models and belief functions; civil infrastructure systems; image and signal processing; resilience engineering; and railway track analysis. Dr. Attoh-Okine has edited five books in the areas of computational intelligence, infrastructure systems and has served as an Associate Editor of various ASCE and IEEE journals.

Computers in Railways XV -
C.A. Brebbia 2016-09-15

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This title incorporates the 15th proceedings of the very successful International Conference on Railway Engineering Design and Operation (COMPRAIL) series, which began in Frankfurt 1987 and continued in Rome (1990); Washington (1992); Madrid (1994); Berlin (1996); Lisbon (1998); Bologna (2000); Lemnos (2002); Dresden (2004); Prague (2006); Toledo (2008); Beijing (2010); the New Forest, home of the Wessex Institute (2012) and, again in Rome in 2014. The papers presented at this conference aim to update the use of advanced systems, promoting their general awareness throughout the management, design, manufacture and operation of railways and other emerging passenger, freight and transit systems. With the conference attracting a variety of specialists, including railway engineers, designers of advanced train control systems and computer specialists, the book particularly emphasises the use of computer systems in advanced railway engineering.

Topics include but are not restricted to: Advanced train control Operations quality; Risk management; Planning and policy; Energy supply and consumption; Communications and signalling; Operational planning; Interface management; Systems integration; Maglev; High speed technology; Interoperability; Passenger flow management; Computer simulations and Driverless and automatic train operation.

Inverse Dynamics Problems

- Hamed Kalhori 2021-06-15

The inverse dynamics problem was developed in order to provide researchers with the state of the art in inverse problems for dynamic and vibrational systems. Contrasted with a forward problem, which solves for the system output in a straightforward manner, an inverse problem searches for the system input through a procedure contaminated with errors and uncertainties. An inverse problem, with a focus on structural dynamics, determines the changes made to the system and estimates the

inputs, including forces and moments, to the system, utilizing measurements of structural vibration responses only. With its complex mathematical structure and need for more reliable input estimations, the inverse problem is still a fundamental subject of research among mathematicians and engineering scientists. This book contains 11 articles that touch upon various aspects of inverse dynamic problems.

Vehicle Dynamics - Rao V. Dukkipati 2000

Growing worldwide populations increasingly require faster, safer, and more efficient transportation systems. These needs have led to a renewed interest in high-speed guided ground transportation technology, inspired considerable research, and instigated the development of better analytical and experimental tools. A very significant body of knowledge currently exists, but has primarily remained scattered throughout the literature.

Vehicle Dynamics consolidates

information from a wide spectrum of sources in the area of guided ground transportation. Each chapter provides a concise, thorough statement of the fundamental theory, followed by illustrative worked examples and exercises. The author also includes a variety of unsolved problems designed to amplify and extend the theory and provide problem-solving experience. The subject of guided ground transportation is vast, but this book brings together the core topics, providing in-depth treatments of topics ranging from system classification, analysis, and response to lading dynamics and rail, air cushion, and maglev systems. In doing so, *Vehicle Dynamics* offers a singular opportunity for readers to build the solid background needed for solving practical vehicle dynamics problems or pursuing more advanced or specialized studies.

Mechanics of Ballasted Rail Tracks - Buddhima Indraratna
2005-08-11

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In this book, the authors discuss testing of ballast, including the strength, deformation and degradation aspects of fresh and recycled ballast under monotonic and cyclic loading. The effectiveness of geosynthetics in stabilising recycled ballast has also been examined. A new stress-strain constitutive model for ballast incorporating particle breakage is presented. Finally, a new range of particle gradations, balancing the strength and permeability requirements, has been proposed for future rail tracks. This book is intended as a reference text for final year civil engineering students and postgraduates, and for practicing railway engineers with the task of modernizing existing designs.

Sustainable Railway Engineering and Operations

- Simon Blainey 2022-08-08

Railways are frequently promoted as one of the most sustainable modes of transport. However, their impact will in practice be significantly affected by the ways in which

they are designed, constructed, and used. This book provides a comprehensive overview of the issues involved in planning, engineering and operating sustainable railway systems.

Fundamentals of Railway Design - Marco Guerrieri
2023-03-17

This textbook examines key railway engineering topics useful for railway design and control. Conventional railways are considered together with high-speed railways, tramways, metros, maglev and hyperloop systems, people movers, monorails and rack railways. Every system of transport is described in its basic technical characteristics, especially in terms of transportation system capacity, alignment design criteria and construction costs. It is an introductory book to specific topics of the railway engineering field, and thus, the mathematical treatment is purposely brief and simplified. The book is an ideal learning resource for students of civil engineering, as well as a valuable reference for practicing engineers involved

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with railway designs.

The Mechanical Behaviour of Ballasted Railway Tracks - Akke Simon Johanna Suiker 2002-01-01

Best Practices on Advanced Condition Monitoring of Rail Infrastructure Systems

- Stefano Bruni 2022-03-14
This Research Topic eBook comprises Volume I and Volume II of Best Practices on Advanced Condition Monitoring of Rail Infrastructure Systems.

Railway Management and Engineering - V Profillidis 2017-11-30

In a rapidly changing world, with increasing competition in all sectors of transportation, railways are in a period of restructuring their management and technology. New methods of organization are introduced, commercial and tariff policies change radically, a more entrepreneurial spirit is required. At the same time, new high-speed tracks are being constructed and old tracks are renewed, high-

comfort rolling stock vehicles are being introduced, logistics and combined transport are being developed. Awareness of environmental issues and search for greater safety give to the railways a new role within the transportation system. Meanwhile, methods of analysis have significantly evolved, principally due to computer applications and new ways of thinking and approaching old problems. Therefore it becomes necessary to come up with a new scientific approach to tackle management and engineering aspects of railways, to understand in-depth the origins and inter-relationships of the various situations and phenomena and to suggest the appropriate methods and solutions to solve the various emerging problems. This book aims to cover the need for a new scientific approach for railways. It is written for railway managers, economists and engineers, consulting economists and engineers, students of schools of

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engineering, transportation and management. The book is divided into three distinct parts: Part A deals with the management of railways, Part B deals with the track and, Part C deals with rolling stock and environmental topics. Each chapter of the book contains the necessary theoretical analysis of the phenomena studied, the recommended solutions, applications, charts and design of the specific railway component. In this way, both the requirement for a theoretical analysis is met, and the need of the railway manager and engineer for tables, nomographs, regulations, etc. is satisfied. Railways in Europe have separated activities of infrastructure from those of operation. In other parts of the world, however, railways remain unified. The book addresses both situation. Railways present great differences in their technologies. Something may be valid for one such technology, but not for another. To overcome this

problem, regulations of the International Union of Railways (UIC) as well as European Standardization (CEN) have been used to the greatest extent possible. Whenever a specific technology or method is presented, the limits of its application are clearly emphasized.

Reliability and Safety in Railway - Xavier Perpinya
2012-03-30

In railway applications, performance studies are fundamental to increase the lifetime of railway systems. One of their main goals is verifying whether their working conditions are reliable and safety. This task not only takes into account the analysis of the whole traction chain, but also requires ensuring that the railway infrastructure is properly working. Therefore, several tests for detecting any dysfunctions on their proper operation have been developed. This book covers this topic, introducing the reader to railway traction fundamentals, providing some ideas on safety and reliability

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issues, and experimental approaches to detect any of these dysfunctions. The objective of the book is to serve as a valuable reference for students, educators, scientists, faculty members, researchers, and engineers.

Cost-effective Maintenance of Railway Track - R. A. Vickers 1992

By far the greatest proportion of the total cost of maintaining the infrastructure of a railway arises from the track, Modern trains are lighter, travel faster and are much easier to derail than before. Therefore it is vital that track is maintained adequately. This volume shows how railways can be kept running using the minimum necessary maintenance, taking into account the environmental conditions and the type and volume of traffic using the railway.

Advances in Transportation Geotechnics IV - Erol Tutumluer 2021-09-05

This volume presents selected papers presented during the 4th International Conference on Transportation Geotechnics.

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.

Modern Railway Track - Coenraad Esveld 2001

The Dynamics of Vehicles on Roads and on Tracks - Robert Frohling 2021-07-01

These proceedings provide an authoritative source of information in the field of suspension design, vehicle-infrastructure interaction, mechatronics and vehicle control systems for road as well as rail vehicles. The research presented includes modelling and simulation.

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Wheel-Rail Interface Handbook
- R. Lewis 2009-09-25

Many of the engineering problems of particular importance to railways arise at interfaces and the safety-critical role of the wheel/rail interface is widely acknowledged. Better understanding of wheel/rail interfaces is therefore critical to improving the capacity, reliability and safety of the railway system. Wheel-rail interface handbook is a one-stop reference for railway engineering practitioners and academic researchers. Part one provides the fundamentals of contact mechanics, wear, fatigue and lubrication as well as state-of-the-art research and emerging technologies related to the wheel/rail interface and its management. Part two offers an overview of industrial practice from several different regions of the world, thereby providing an invaluable international perspective with practitioners' experience of managing the wheel/rail interface in a variety of environments and

circumstances. This comprehensive volume will enable practising railway engineers, in whatever discipline of railway engineering - infrastructure, vehicle design and safety, and so on - to enhance their understanding of wheel/rail issues, which have a major influence on the running of a reliable, efficient and safe railway. One-stop reference on the important topic of wheel rail-interfaces Presents the fundamentals of contact mechanics, wear, fatigue and lubrication Examines state-of-the-art research and emerging technologies related to wheel-rail interface and its management

Maintenance Costs and Life Cycle Cost Analysis - Diego Galar 2017-09-18

Authors have attempted to create coherent chapters and sections on how the fundamentals of maintenance cost should be organized, to present them in a logical and sequential order. Necessarily, the text starts with importance of maintenance function in the

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organization and moves to life cycle cost (LCC) considerations followed by the budgeting constraints. In the process, they have intentionally postponed the discussion about intangible costs and downtime costs later on in the book mainly due to the controversial part of it when arguing with managers. The book will be concluding with a short description of a number of sectors where maintenance cost is of critical importance. The goal is to train the readers for a deeper study and understanding of these elements for decision making in maintenance, more specifically in the context of asset management. This book is intended for managers, engineers, researchers, and practitioners, directly or indirectly involved in the area of maintenance. The book is focused to contribute towards better understanding of maintenance cost and use of this knowledge to improve the maintenance process. Key Features: • Emphasis on maintenance cost and life cycle

cost especially under uncertainty. • Systematic approach of how cost models can be applied and used in the maintenance field. • Compiles and reviews existing maintenance cost models. • Consequential and direct costs considered. • Comparison of maintenance costs in different sectors, infrastructure, manufacturing, transport. **Modern Railway Track** - Coenraad Esveld 1989
Rail guidance principle - Curves and gradients - Track stability and longitudinal forces - Track design - Track construction - The rail - Track maintenance and renewal. Ultrasonic rail inspection - Recording systems - Railway-induced ground vibrations and noise - High-speed tracks. The Railway Track and Its Long Term Behaviour - Konstantinos Tzanakakis 2013-01-26
A proper quality of a track and other infrastructure objects represents a basic requirement for train safety and punctuality. Most of the physical systems and their components deteriorate over time. This

affects performance and may lead to failures. Albert Einstein said, "You have to learn the rules of the game. And then you have to play better than anyone else." Only if we understand how the whole system works, taking into account its imperfections and how they influence its quality and performance will we be able to learn the rules of the game and "play better." The book provides the readers with the necessary functional knowledge of track behaviour and comprehensively covers the function of the various track components, their interaction as elements of the track system, as well as the interaction of the track with railway vehicles. By presenting important tools for a deep understanding of track-behaviour this book aims to be a reference guide for infrastructure managers and to help them to find ways improving track quality for optimum long-term behaviour.

**Track Data-Oriented
Maintenance Intervention
Limit Determination for**

**Ballasted Light Rail Tracks
through Multibody**

Simulations - David Camacho
Alcocer 2021-07-13

Light rail trains (LRT) are an important part of public transport but due to perceived high life-cycle costs are not always considered suitable. Life cycle cost reduction might be achieved through a knowledge-based maintenance management rather than just on experience. This work develops limits of maintenance and renewal of LRT systems based on vehicle reactions to the current track quality through measured data, multibody simulations and track geometry indices. An approach based on knowledge would lead to a track condition which allows a safe, comfortable, and under an appropriate maintenance strategy, economically profitable operation.

**Railway Transportation
Systems** - Christos N. Pyrgidis
2021-10-31

Railway Transportation
Systems covers the entire
range of railway passenger

systems, from conventional and high-speed intercity systems to suburban, regional, operating on steep gradients, and urban ones. It also examines in depth freight railway systems transporting conventional loads, heavy loads, and dangerous goods. For each system, the text provides a definition; an overview of its evolution and examples of good practice; the main design, construction, and operational characteristics; and the preconditions for its selection. Additionally, it offers a general overview of safety, interfaces with the environment, forces acting on the track, and techniques that govern the stability and guidance of railway vehicles. This new edition brings two new chapters. One concerns pre-feasibility studies of urban rail projects, and the other analyses the operation of railway systems under specific weather conditions and natural phenomena. New material examines dilemmas, trends and innovations in rail freight transportation; a new definition

for high-speed rail; a number of case studies; and an update of cutting-edge technologies. It is ideal for graduate students, engineers, consultants, manufacturers, and transport company executives who need a reference and guide.

Maintenance, Safety, Risk, Management and Life-Cycle Performance of Bridges - Nigel Powers 2018-07-04

Maintenance, Safety, Risk, Management and Life-Cycle Performance of Bridges contains lectures and papers presented at the Ninth International Conference on Bridge Maintenance, Safety and Management (IABMAS 2018), held in Melbourne, Australia, 9-13 July 2018. This volume consists of a book of extended abstracts and a USB card containing the full papers of 393 contributions presented at IABMAS 2018, including the T.Y. Lin Lecture, 10 Keynote Lectures, and 382 technical papers from 40 countries. The contributions presented at IABMAS 2018 deal with the state of the art as well as emerging concepts and

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innovative applications related to the main aspects of bridge maintenance, safety, risk, management and life-cycle performance. Major topics include: new design methods, bridge codes, heavy vehicle and load models, bridge management systems, prediction of future traffic models, service life prediction, residual service life, sustainability and life-cycle assessments, maintenance strategies, bridge diagnostics, health monitoring, non-destructive testing, field testing, safety and serviceability, assessment and evaluation, damage identification, deterioration modelling, repair and retrofitting strategies, bridge reliability, fatigue and corrosion, extreme loads, advanced experimental simulations, and advanced computer simulations, among others. This volume provides both an up-to-date overview of the field of bridge engineering and significant contributions to the process of more rational decision-making on bridge

maintenance, safety, risk, management and life-cycle performance of bridges for the purpose of enhancing the welfare of society. The Editors hope that these Proceedings will serve as a valuable reference to all concerned with bridge structure and infrastructure systems, including students, researchers and engineers from all areas of bridge engineering.

Advances in Transportation Geotechnics 2 - Seiichi Miura
2012-08-31

Advances in Transportation Geotechnics II deals with the geotechnics of roads, railways and airfields. Providing economic and sustainable transportation infrastructures for societies is highly dependent on progress made in this field. These contributions to the 2nd International Conference on Transportation Geotechnics (Hokkaido, Japan, 10-12 Septe

Proceedings of the 1st International Workshop on High-Speed and Intercity Railways - Yi-Qing Ni
2012-02-21

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This book contains the papers included in the proceedings of the 1st International Workshop on High-speed and Intercity Railways (IWHIR 2011) held in Shenzhen and Hong Kong, China from July 19 to July 22, 2011, which is organized by The Hong Kong Polytechnic University, in collaboration with Southwest Jiaotong University, Beijing Jiaotong University, Dalian Jiaotong University, China Engineering Consultants, Inc., Zhejiang University, and Tsinghua University. Continuing the great initiatives and momentums of the rapid development in high-speed and intercity railways worldwide in recent years, IWHIR 2011 aims at providing a platform for academic scholars and practicing engineers to share knowledge and experience, to promote collaboration, and to strengthen R&D activities related to railway engineering. Engineers, scientists, professors, and students from universities, research institutes, and related industrial companies have been

cordially invited to participate in the workshop. These papers have covered a wide range of issues concerning high-speed and intercity railways in the theoretical, numerical, and experimental work pertaining to high-speed and intercity railways. Showcasing diversity and quality, these papers report the state-of-the-art and point to future directions of research and development in this exciting area.

Evolutionary Computation in Practice - Tina Yu

2008-01-23

This book is loaded with examples in which computer scientists and engineers have used evolutionary computation - programs that mimic natural evolution - to solve many real-world problems. They aren't abstract, mathematically intensive papers, but accounts of solving important problems, including tips from the authors on how to avoid common pitfalls, maximize the effectiveness and efficiency of the search process, and many other practical suggestions.

Advanced Rail

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Geotechnology - Ballasted Track - Buddhima Indraratna
2011-03-16

Ballast plays a vital role in transmitting and distributing train wheel loads to the underlying sub-ballast and subgrade. Bearing capacity of track, train speed, riding quality and passenger comfort all depend on the stability of ballast through mechanical interlocking of particles. Ballast attrition and breakage occur progressively under heavy cyc

Geotechnical Aspects of Underground Construction in Soft Ground - Charles W.W. Ng
2008-12-03

This volume comprises a collection of four special lectures, six general reports and 112 papers presented at the Sixth International Symposium of Geotechnical Aspects of Underground Construction in Soft Ground (IS-Shanghai) held between 10 and 12 April 2008 in Shanghai, China. The Symposium was organised by Tongji University and the following t

Railway Noise and Vibration

- David Thompson 2008-12-11
Railways are an environmentally friendly means of transport well suited to modern society. However, noise and vibration are key obstacles to further development of the railway networks for high-speed intercity traffic, for freight and for suburban metros and light-rail. All too often noise problems are dealt with inefficiently due to lack of understanding of the problem. This book brings together coverage of the theory of railway noise and vibration with practical applications of noise control technology at source to solve noise and vibration problems from railways. Each source of noise and vibration is described in a systematic way: rolling noise, curve squeal, bridge noise, aerodynamic noise, ground vibration and ground-borne noise, and vehicle interior noise. Theoretical modelling approaches are introduced for each source in a tutorial fashion. Practical applications of noise control technology are

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presented using the theoretical models Extensive examples of application to noise reduction techniques are included Railway Noise and Vibration is a hard-working reference and will be invaluable to all who have to deal with noise and vibration from railways, whether working in the industry or in consultancy or academic research. David Thompson is Professor of Railway Noise and Vibration at the Institute of Sound and Vibration Research, University of Southampton. He has

worked in the field of railway noise since 1980, with British Rail Research in Derby, UK, and TNO Institute of Applied Physics in the Netherlands before moving to Southampton in 1996. He was responsible for developing the TWINS software for predicting rolling noise. Discusses fully the theoretical background and practical workings of railway noise Includes the latest research findings, brought together in one place Forms an extended case study in the application of noise control techniques