

tables, as well as numerous appendices.

Maurice Olley, one of the great automotive design, research and development engineers of the 20th century, had a career that spanned two continents. Olley is perhaps best known for his systematic approach to ride and handling. His work was so comprehensive that many of the underlying concepts, test procedures, analysis, and evaluation techniques are still used in the auto industry today. Olley's mathematical analyses cover design essentials in a physically understandable way. Thus they remain as useful today as when they were first developed. For example, they are easily programmed for study or routine use and for checking the results of more complex programs. Chassis Design – Principles and Analysis is based on Olley's technical writings, and is the first complete presentation of his life's work. This new book provides insight into the development of chassis technology and its practical application by a master. Many examples are worked out in the text and the analytical developments are underpinned by Olley's years of design experience. COMPLETE CONTENTS Maurice Olley – his life and times Tyres and steady–state cornering – slip angle effects (primary) Steady–state cornering– steer effects (secondary) Transient cornering Ride Oscillations of the unsprung Suspension linkages Roll, roll moments, and skew rates Fore–and–aft forces Leaf springs – combined suspension spring and linkage Appendices Comprehensive and well–illustrated with over 400 figures and tables, as well as numerous appendices.

The book starts with an historical overview of road vehicles. The first part deals with the forces exchanged between the vehicle and the road and the vehicle and the air with the aim of supplying the physical facts and the relevant mathematical models about the forces which dominate the dynamics of the vehicle. The second part deals with the dynamic behaviour of the vehicle in normal driving conditions with some extensions towards conditions encountered in high-speed racing driving. Contents: Short Historical Notes on Motor Vehicles Forces Acting between Road and Wheel Road Vehicle Aerodynamics Longitudinal Dynamics Handling of a Rigid Vehicle Motor Vehicle on Elastic Suspensions Road Accidents Readership: Mechanical engineers. keywords: Motor Vehicle Dynamics; Motor Vehicle Handling; Motor Vehicle Comfort; Motor Vehicle Stability; Motor Vehicle Simulation; Motor Vehicle Aerodynamics; Motor Vehicle Suspensions; Tires; Road Accidents; Vehicle-Driver Interaction "... the author provides an interesting and comprehensive treatment of a very complicated subject ... it would be a good addition to the bookshelf of any engineer with an interest in vehicle dynamics or general automotive technology." Applied Mechanics Reviews

The increase in levels of sophistication and complexity of modern passenger cars and commercial vehicles is being driven by environmental requirements. Braking systems can no longer be considered in isolation - the interactions between vehicle braking, steering, handling, etc., particularly in emergency conditions, are leading to the development of adaptive integrated vehicle control systems. Building upon the success of previous volumes in the series, Braking 2004-Vehicle Braking and Chassis Control reflects the interaction of braking with the whole vehicle. Road vehicle braking behaviour experts, both from academia and industry, present the latest research and development devoted and applied to all aspects of braking, and report on field experiences with modern sophisticated systems. Braking 2004 is essential reading for engineers and researchers from across a wide range of disciplines, from highway engineers and tyre specialists to experts in intelligent control systems, and including, of course the traditional foundation - brake specialists. From his teens to his 90s, William F. "Bill" Milliken has played a pioneering role in the key technical achievements of the American Century — the development of airplanes and automobiles for maximum stability and control. Inspired as a teenager by Lindbergh's epic flight, Milliken designed, built and flew his own airplane by age 22. Graduating from MIT, he entered an aircraft industry gearing up for war. A daring airman himself, Milliken worked at great personal risk to push the B-17 bomber's operating ceiling above the flak, and to prove the B-29 airworthy. After the war, at the Cornell Aeronautical Laboratories (CAL), Milliken spearheaded a fundamental change in how aircraft are designed. Ever ready for adventure, automobile racing became Milliken's major hobby. As a guiding force of the infant Sports Car Club of America (SCCA), competition led Milliken to recognize the applicability of his aeronautical research to the automobile's safety and performance. The new discipline of vehicle dynamics — Milliken's second fundamental contribution to human transportation — has earned him the highest engineering honors. At 95, major auto racing teams still seek his consultation. His technical texts are required reading for today's automotive engineers and students. The sign for Milliken's Corner along the old Watkins Glen Grand Prix course alerts drivers to slow down, but even today, Bill steps on it. The only thing he is certain will happen is that he'll learn something.

Proceedings of the FISITA 2012 World Automotive Congress are selected from nearly 2,000 papers submitted to the 34th FISITA World Automotive Congress, which is held by Society of Automotive Engineers of China (SAE-China) and the International Federation of Automotive Engineering Societies (FISITA). This proceedings focus on solutions for sustainable mobility in all areas of passenger car, truck and bus transportation. Volume 7: Vehicle Design and Testing (I) focuses on: • Vehicle Performance Development • Vehicle Integration Platformized and Universal Design • Development of CAD /CAE/CAM and CF Methods in Automotive Practice • Advanced Chassis, Body Structure and Design • Automotive Ergonomic, Interior and Exterior Trim Design • Vehicle Style and Aerodynamic Design • New Materials and Structures Above all researchers, professional engineers and graduates in fields of automotive engineering, mechanical engineering and electronic engineering will benefit from this book. SAE-China is a national academic organization composed of enterprises and professionals who focus on research, design and education in the fields of automotive and related industries. FISITA is the umbrella organization for the national automotive societies in 37 countries around the world. It was founded in Paris in 1948 with the purpose of bringing engineers from around the world together in a spirit of cooperation to share ideas and advance the technological development of the automobile.

This book analyzes the updated principles and applications of nonlinear approaches to solve engineering and physics problems. The knowledge on nonlinearity and the comprehension of nonlinear approaches are inevitable to future engineers and scientists, making this an ideal book for engineers, engineering students, and researchers in engineering, physics, and mathematics. Chapters are of specific interest to readers who seek expertise in optimization, nonlinear analysis, mathematical modeling of complex forms, and non-classical engineering problems. The book covers methodologies and applications from diverse areas such as vehicle dynamics, surgery simulation, path planning, mobile

robots, contact and scratch analysis at the micro and nano scale, sub-structuring techniques, ballistic projectiles, and many more.

Multibody Systems Approach to Vehicle Dynamics aims to bridge a gap between the subject of classical vehicle dynamics and the general-purpose computer-based discipline known as multibody systems analysis (MBS). The book begins by describing the emergence of MBS and providing an overview of its role in vehicle design and development. This is followed by separate chapters on the modeling, analysis, and post-processing capabilities of a typical simulation software; the modeling and analysis of the suspension system; tire force and moment generating characteristics and subsequent modeling of these in an MBS simulation; and the modeling and assembly of the rest of the vehicle, including the anti-roll bars and steering systems. The final two chapters deal with the simulation output and interpretation of results, and a review of the use of active systems to modify the dynamics in modern passenger cars. This book intended for a wide audience including not only undergraduate, postgraduate and research students working in this area, but also practicing engineers in industry who require a reference text dealing with the major relevant areas within the discipline. * Full of practical examples and applications * Uses industry standard ADAMS software based applications * Accompanied by downloadable ADAMS models and data sets available from the companion website that enable readers to explore the material in the book * Guides readers from modelling suspension movement through to full vehicle models able to perform handling manoeuvres

Written for students and practicing engineers working in automotive engineering, this book provides a fundamental yet comprehensive understanding of chassis systems and requires little prior knowledge on the part of the reader. It presents the material in a practical and realistic manner, using reverse engineering as a basis for examples to reinforce understanding of the topics. The specifications and characteristics of vehicles currently on the market are used to exemplify the theory's application, and care is taken to connect the various topics covered, so as to clearly demonstrate their interrelationships. The book opens with a chapter on basic vehicle mechanics, which include the forces acting on a vehicle in motion, assuming a rigid body. It then proceeds to a chapter on steering systems, which provides readers with a firm understanding of the principles and forces involved under static and dynamic loading. The next chapter focuses on vehicle dynamics by considering suspension systems—tyres, linkages, springs, dampers etc. The chapter on chassis structures and materials includes analysis tools (typically, finite element analysis) and design features that are used to reduce mass and increase occupant safety in modern vehicles. The final chapter on Noise, Vibration and Harshness (NVH) includes a basic overview of acoustic and vibration theory and makes use of extensive research investigations and practical experience as a means of addressing NVH issues. In all subject areas the authors take into account the latest trends, anticipating the move towards electric vehicles, on-board diagnostic monitoring, active systems and performance optimisation. The book features a number of worked examples and case studies based on recent research projects. All students, including those on Master's level degree courses in Automotive Engineering, and professionals in industry who want to gain a better understanding of vehicle chassis engineering, will benefit from this book.

This work serves as a reference concerning the automotive chassis, i.e. everything that is inside a vehicle except the engine and the body. It is the result of a decade of work mostly done by the FIAT group, who supplied material, together with other automotive companies, and sponsored the work. The first volume deals with the design of automotive components and the second volume treats the various aspects of the design of a vehicle as a system.

Together with his colleagues at Citroën, Andre Lefebvre created the Traction Avant (1934), the TUB (1939) – Citroën's first front wheel drive utility van that was succeeded by the H and HY vans (1947) – the Deux Chevaux (1948), and, last but not least, the DS (1955). From 1923 to 1931 Lefebvre also designed several highly original and outstanding competition cars and record-breaking automobiles for Voisin. He even drove some these cars in races and record attempts. It is obvious that during his 16 years with Gabriel Voisin he was very much influenced by the ideas of this illustrious aviation pioneer and car manufacturer. The experience gained during that period gave him the self-confidence to persuade his successive bosses at Citroën that his unorthodox approach to automobile design was what the company needed; first he convinced André Citroën, later Pierre Michelin, then Pierre-Jules Boulanger, and finally Robert Puiseux and Pierre Bercot. His oeuvre for Citroën alone earns him a place of honour among the great automobile designers of the past century. The fact that most present-day cars still carry the DNA of his design philosophy makes him stand out above other automotive pioneers and innovators. That is why it is amazing that so little is known about this fascinating and brilliant engineer. This book was written in order to remedy that, and to pay tribute to André Lefebvre: the passionate pioneer who left car enthusiasts around the world such an important heritage.

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The papers in this volume consider the innovation process in vehicle design. Topics include: trends in propulsion technology; powertrain development methods; hybrid vehicle technologies; choice of components; vehicle design and visualization; and vehicle systems technologies.

An introduction to vehicle dynamics and the fundamentals of mathematical modeling Fundamentals of Vehicle Dynamics and Modeling is a student-focused textbook providing an introduction to vehicle dynamics, and covers the fundamentals of vehicle model development. It illustrates the process for construction of a mathematical model through the application of the equations of motion. The text describes techniques for solution of the model, and demonstrates how to conduct an analysis and interpret the results. A significant portion of the book is devoted to the classical linear dynamic models, and provides a foundation for understanding and predicting vehicle behaviour as a consequence of the design parameters. Modeling the pneumatic tire is also covered, along with methods for solving the suspension kinematics problem, and prediction of acceleration and braking performance. The book introduces the concept of multibody dynamics as applied to vehicles and provides insight into how large and high fidelity models can be constructed. It includes the development of a method suitable for computer implementation, which can automatically generate and solve the linear equations of motion for large complex models. Key features: ? Accompanied by a website hosting MATLAB® code. ? Supported by the Global Education Delivery channels. Fundamentals of Vehicle Dynamics and Modeling is an ideal textbook for senior undergraduate and graduate courses on vehicle dynamics.

