1

Design of traction control system for electric scooter using self-organising fuzzy control [Texto impreso] / Bo-Chiuan Chen, Chia-Hsing Chu, Shiuh-Jer Huang

Este artículo se encuentra disponible en su edición impresa. Los datos para su localización están accesibles a través del enlace al título de la publicación.

References: p. 99-100 : 11 refs.

A Traction Control System (TCS) using Self-Organising Fuzzy Control (SOFC) is proposed for electric scooter in this paper. Vertical load and traction force observers are used to estimate road friction coefficient. Road condition observer is used to estimate the gradient of road friction coefficient with respect to tyre slip ratio. Reference slip ratio for TCS is determined using estimated gradient. According to the error and error change of slip ratio, SOFC adjusts the torque demand for wheel motor. Simulation and experimental results show that the proposed TCS can detect road friction change and maintain slip ratio in the stable region.

International Journal of Vehicle Design. -- 2013, v. 62, n. 1, p. 87-100

1. TCS 2. Traction control system 3. SOFC 4. Self-organising fuzzy control 5. Slip ratio control 6. Wheel motor 7. Electric scooter

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2

Engine block soundproofing: on meta-models of poroelastic materials for acoustic absorption and head injury criterion [Texto impreso] / Slaheddine Chedly, Ameur Chettah, Mohamed Ichchou

Este artículo se encuentra disponible en su edición impresa. Los datos para su localización están accesibles a través del enlace al título de la publicación.

References: p. 85-86 : 32 refs.

The purpose of this work is the investigation of meta-models quantifying shock and acoustic indicators. The vehicle design of the engine block insulating poroelastic materials is considered. An analytical tool is proposed. It facilitates decision-making. Modelling tools (Design of Experiments techniques, kriging models,) are used to build empirical models expressing the Head Injury Criterion (HIC) and the acoustic absorption coefficient of poroelastic materials. Models defined here allow HIC and acoustic absorption predictions to be made for any porous material whose intrinsic characteristics are included in the design space. Such models offer effective alternative to finite-element formulations, with considerable time saving.

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1. Acoustic absorption 2. HIC 3. Head injury criterion 4. Meta-modelisation 5. Poroelastic characteristics 6. Kriging model

3

Experimental study on the impact of operating conditions on PCCI combustion [Texto impreso] / C.A.J. Leermakers, C.C.M. Luijten, L.M.T. Somers, L.P.H. De Goey; B.A. Albrecht

Este artículo se encuentra disponible en su edición impresa. Los datos para su localización están accesibles a través del enlace al título de la publicación.

References: p. 18-19 : 17 refs.

In a short-term scenario, using near-standard components and conventional fuels, PCCI combustion relies on a smart choice of operating conditions. Here, the effects of operating conditions on ignition delay, available mixing time, combustion phasing and emissions are investigated. In the PCCI regime, NOX and smoke have been shown to be efficiently reduced with elongated mixing time. For viable PCCI combustion, one would require a Combustion Delay (CD) which is long enough to bring both NOX and smoke levels down to acceptable values. For the completeness of combustion, the resulting unburned hydrocarbon and carbon monoxide emissions, as well as the associated fuel consumption; mixing time should, however, be as short as possible. Most parameters strongly correlate with combustion delay, independent of how this is achieved. Lastly, the best points experienced for a number of cases are given.

International Journal of Vehicle Design. -- 2013, v. 62, n. 1, p. 1-20

1. PCCI 2. Premixed charge compression ignition 3. Diesel 4. Operating conditions 5. EGR 6. Exhaust gas recirculation 7. Intake pressure 8. Intake temperature 9. Combustion delay 10. Mixing time

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4

Robust design strategy applied to a vehicle suspension system with high camber angle tyres [Texto impreso] / Estelle Koensgen ... [et al.]

Este artículo se encuentra disponible en su edición impresa. Los datos para su localización están accesibles a través del enlace al título de la publicación.

References: p. 66-67 : 21 refs.

This paper presents the robust design of a suspension system suitable for tyres whose camber angle can cover a large interval. The originality of this study is to take account of the tyre camber angle within the range (+/−20°) in the robust design of a vehicle suspension system. The methodology is based on the hierarchical organisation of the design process, on simplified models, on sensitivity analysis and on robust optimisation. The paper describes the robust design methods, the modelling of the tyre, the design process and the results. Two models of car tyres valid for high camber angles have been defined. The design strategy based on 'First Design' and 'Rational Design' methods, as well as on the 'Electre' decision-support method, shows its strong potential for finding efficient and robust solutions. The feasibility of integrating an axle into the steering system at high camber angles is demonstrated.

International Journal of Vehicle Design. -- 2013, v. 62, n. 1, p. 42-71

1. Quality 2. Robust design 3. Camber angle 4. Tyre 5. Optimisation 6. Vehicle dynamics 7. Vehicle suspension system

5

Study of a magnetorheological fluid damper with multiple annular flow gaps [Texto impreso] / Janusz Goldasz

Este artículo se encuentra disponible en su edición impresa. Los datos para su localización están accesibles a través del enlace al título de la publicación.

References: p. 40-41 : 25 refs.

One of the challenges when engineering Magnetorheological (MR) fluid based devices is the development of a model that is capable of fairly accurate predictions of the device performance characteristics. In the case of MR dampers engineering and modelling studies are complicated due to a large number of multidisciplinary variables and mutual interactions between them. Therefore, it is the intent of the author to propose a math-based model of a monotube MR damper capable of simulating a wide range of piston configurations. The model utilizes a dimensionless representation of the Bingham model for simulating the fluid flow through the piston and data reduction. The study is complemented by extensive simulations of the magnetic circuit as well as the damper hydraulics. The model can be extended for the cases involving any number of parallel concentric annular flow paths in the piston. The obtained results are presented in the form of averaged flux density vs. coil ampere turns graphs, steady-state force-velocity maps and force-velocity as well as force-displacement phase planes, respectively.

International Journal of Vehicle Design. -- 2013, v. 62, n. 1, p. 21-41

1. Magnetorheological fluid dampers 2. Multiple flow gaps 3. Lumped parameter model 4. Magnetostatic analysis 5. Bingham model