1

A novel technique for multiaxial fatigue modelling of ground vehicle notched components [Texto impreso] / Ayhan Ince

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. 313 : 10 refs.

Fatigue failures of driveline and suspension for ground vehicles under multiaxial loading conditions are common, since most of those components are subjected to complex multiaxial loadings in service. A computational fatigue analysis methodology has been proposed here for performing multiaxial fatigue life prediction for notched components using analytical and numerical methods. The proposed fatigue analysis methodology consists of an elastic-plastic stress/strain model and a multiaxial fatigue damage parameter.
Results of the proposed fatigue analysis methodology are compared to sets of experimental data published in the literature to verify the prediction capability of the elastic-plastic stress/strain model and the multiaxial fatigue damage parameter. Based on the comparison between calculated results and experimental data, it is found that the proposed multiaxial analysis methodology correlates well with experimental strain data for SAE 1070 steel notched shafts and experimental fatigue data of SAE 1045 steel notched shafts.

International Journal of Vehicle Design. -- 2015, v. 67, n. 3, p. 294-313

1. Fatigue life 2. Ground vehicle 3. Notched component 4. Stress-strain analysis

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2

Integrated control of automobile ABS/DYC/AFS for improving braking performance and stability [Texto impreso] / Chong Feng, Nenggen Ding, Yongling He, Wen Chen

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. 291 : 13 refs.

Braking control on a μ-split road is not an easy task. An integrated control (ITC) algorithm is proposed by combining antilock braking system (ABS), direct yaw-moment control (DYC) and active front steering (AFS). The algorithm is intended for maximising the utilisation of road friction while maintaining directional stability of a vehicle during emergency braking on a μ-split road. A three-layer hierarchical control architecture is developed for the ITC. The upper-layer controller is used for DYC to generate a desired yaw moment, allocation of the moment to ABS and AFS is handled by the intermediate-layer controller, and two control algorithms are designed at the lower-layer for ABS and AFS, respectively. The performance of the ITC is compared with a modified independent control (MIC) algorithm via hardware-in-the-loop (HIL) simulations. The results show that the braking performance and stability of the vehicle are improved by employing the ITC algorithm.

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1. ABS 2. Active front steering 3. AFS 4. Antilock braking system 5. Direct yaw-moment control 6. DYC 7. Integrated control

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3
Physics-based modelling method for automotive radar with frequency shift keying and linear frequency modulation [Texto impreso] / Shuqing Zeng, Weiwen Deng

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. 258 : 13 refs.

In this paper, a novel physics-based method is presented in modelling the low-level physical characteristics of automotive radars. The aim is to enable real time simulation with a high-fidelity radar model to accelerate the development of an advanced driver assistance system (ADAS). The radar model is specifically based on frequency modulated continuous wave (FMCW) using frequency-shift keying and linear frequency modulation (FSK-LFM). Based on this simulated radar sensing system, the object detection algorithm is developed by employing an extended Kalman filter (EKF) approach to track multiple objects. Extensive simulation has been conducted that has verified the proposed radar model under several typical scenarios with adaptive cruise control (ACC) system.

International Journal of Vehicle Design. -- 2015, v. 67, n. 3, p. 237-258

1. Automotive radar 2. Frequency-shift keying and linear frequency modulation 3. FSK-LFM

4
Simulation-based design optimisation to develop a lightweight body-in-white structure focusing on dynamic and static stiffness [Texto impreso] / Morteza Kiani, Hirotaka Shiozaki, Keiichi Motoyama

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. 231-233 : 23 refs.

Through finite element simulations, static and dynamic stiffness of the body-in-white (BIW) model are investigated. Design of computer experiments through Latin hypercube sampling (LHS) is used to sample the vehicle design space defined by the wall thicknesses of 20 parts. Radial basis function (RBF) is used to generate separate surrogate models for selected responses including bending, torsion, lateral and longitudinal stiffness as well as the fundamental natural frequencies. A non-linear constrained optimisation for mass minimisation is formulated and solved under two different cases. In the first case, the BIW model was optimised under just vibration whereas vibration and stiffness requirements are included in the second case. Results show that the noise-vibration-harshness (NVH) performance of the car improves when both vibration and stiffness requirements are included in the optimisation. This guideline not only reduced the mass but also improved the body structure stiffness (static and dynamic) as the basic criteria of body design.

International Journal of Vehicle Design. -- 2015, v. 67, n. 3, p. 219-236

1. BIW 2. Body-in-white 3. Car body structure 4. Noise-vibration-harshness 5. NVH 6. Optimisation 7. Stiffness 8. Surrogate based

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