
Editorial

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Introduction

This special issue of *IJVD* is devoted to the Fourth Automotive Technology Conference on Vehicle Design, Development and Manufacturing (OTEKON'08 – VDDM), which was held in Uludag University, Bursa, Turkey, 1–4 June 2008.

The conference represented the continuation of a series of conferences, held every two years, that aim to promote research and education that will help to solve current and future challenges in vehicle design, development and manufacturing. This special issue of *IJVD* consists of selected papers presented at the OTEKON'08 Conference. The OTEKON originated in 2002 as an Automotive Technologies Conference for the exchange of technical information and research results on every aspect of vehicle design, development and manufacture. The first Automotive Technologies Congress (OTEKON'02) was organised in Bursa, a city in one of Turkey's leading automotive engineering regions, as a meeting through which progress in vehicle research and technology development was presented and discussed by participants from universities, research institutes, government and industry. After the success of OTEKON'02, three subsequent OTEKON conferences have been held every two years hosted by Uludag University, Engineering and Architecture Faculty, Mechanical Engineering Department, in 2004, 2006 and 2008 in Bursa.

OTEKON conferences are a major platform to disseminate recent developments in the area of automotive engineering and to exchange knowledge of advances in the theory and practice of vehicle design, development and manufacturing, including a wide variety of aspects in automotive engineering. The conference covered a wide range of presentations, including keynote speakers, panel, industrial presentations and poster sessions, which brought together participants from academia and industry for four days to share knowledge and to disseminate recent developments in the area of automotive engineering. The OTEKON's goals are to:

- support the research and the advances in automotive engineering to overcome current and future challenges
- support the enhancements in virtual product developments, to ensure higher quality at less cost and time

- present cleaner and safer vehicles with innovative and intelligent vehicle concepts to meet the challenges for sustainable mobility
- support the developments of more efficient and affordable vehicles with maximum efficiency in internal combustion engines and hybrid vehicles to reduce pollutant emissions, fuel consumption and CO₂ emissions, and to develop emission-free vehicles for future mobility
- disseminate recent developments in the area of automotive engineering to make the mobility sustainable.

At OTEKON'08, the focus was on mobility, innovative vehicle concepts, energy sources and use, and safety issues, taking into account global warming and customer requirements. The conference was organised in plenary talks, parallel sessions and industrial presentations involving 90 oral presentations and poster presentations.

Over 100 papers were submitted to the conference and 90 were invited for presentation. All papers accepted to the conference were subject to review prior to presentation, and finally they were included in the proceedings. The papers were accepted on the basis of the quality and relevance of the contents regarding congress topics and goals.

The papers in this special issue were selected to represent the broad range of vehicle design and development topics, from theoretical issues to practical applications. Authors of selected papers were invited to submit an extended version of their papers. The 16 papers here were selected for publication in this special issue based on the review results of the conference papers, and authors were invited to submit their papers according to the required standards of *IJVD*. The extended versions of papers were then reviewed by the advisory committee, and further revisions were requested for further improvement and further review. Twelve extended papers were accepted to be published as research papers and the other four of them as technical notes.

The first paper 'Design and simulation of an integrated active yaw control system for road vehicles' by G. Tekin and Y.S. Ünlüsoy is concerned with the design methodology and simulation results of an active yaw control system for road vehicles. An eight degree of freedom vehicle model is used to represent the real vehicle in the simulations. The second paper 'Framework for development of driver adaptive warning and assistance systems that will be triggered by a driver inattention monitor' by S. Daniş et al. presents the research outline of an experimental vehicle and simulators and their initial use towards the development of driver adaptive warning and assistance systems that will be triggered by a driver inattention monitor in the Drive Safe national consortium project in Turkey.

The two papers are concerned with virtual simulation-based system approaches for vehicle design and optimisation for ride comfort and crashworthiness.

The third paper 'Optimisation of vehicle engine mount system using simulation-based design approach' by I. Karen et al. introduces a simulation-based approach to design optimised engine mount components to isolate the road- and engine-induced vibrations without the need for physical prototypes. The fourth paper 'Multi-objective crashworthiness design optimisation of thin-walled tubes' by N. Kaya and F. Öztürk describes research results to improve the energy absorption performance of crash tubes that are placed behind the bumper in automotive vehicles using shape and size optimisation. The fifth paper 'Design and simulation of an ABS for an integrated active

safety system for road vehicles' by M. Şahin and Y.S. Ünlüsoy is concerned with the safety of road vehicles and presents a design methodology for an antilock braking system (ABS) controller for four-wheeled road vehicles. In this study, a flexible approach was adopted considering integration with an integrated active safety system control structure. The sixth paper 'Simulated annealing approach in scheduling of virtual cellular manufacturing in the automotive industry' by A. Aksoy and N. Öztürk is concerned with the scheduling of virtual cellular manufacturing (VCM) in case of demand changes regarding suppliers in automotive industry and presents an approach based on simulated annealing algorithm and heuristic method as an efficient means of scheduling the manufacturing operations of VCM systems in case of often changing demands.

Two papers are concerned with propulsion systems and vehicle engine performance. The seventh paper 'Propulsion system design of a hybrid electric vehicle' by I. Uygan et al. describes the propulsion system design of an internal-combustion hybrid electric vehicle. The eighth paper 'Numerical and experimental investigation of heat balance in DI diesel engines for neat diesel fuel and gasoline fumigation' by Z. Şahin and O. Durgun consists of two stages: numerical and experimental studies. A computer program has been used for the prediction of diesel engine cycle and engine characteristics for the cases of neat diesel fuel and gasoline fumigation. Heat balance tests for gasoline fumigation have been performed in a single cylinder test engine.

The ninth paper 'Usability of cyclone separators as air filters in vehicles' by I. Karagoz et al. explores the use of cyclone separators as air filters in light or heavy duty vehicles.

Three papers are concerned with computational fluid dynamics and air conditioning solutions to road vehicles. The tenth paper 'Transient numerical analysis of airflow and heat transfer in a vehicle cabin during heating period' by G. Sevilgen and M. Kılıç describes a three-dimensional transient numerical analysis to determine the airflow and heat transfer characteristics inside the vehicle cabin during heating period. The 11th paper 'Experimental performance of an automobile air conditioning system using a variable capacity compressor for two different types of expansion devices' by A. Alkan and M. Hosoz presents an experimental R134a automobile air conditioning (AAC) system with a variable capacity compressor, which has been developed and equipped with various mechanical instruments. The 12th paper 'Dynamic simulation of HVAC system thermal loads in an automobile compartment' by M. Akyol and M. Kılıç describes a dynamic model of the heat loads that affect the thermal behaviour of the automobile compartment that was developed in a Matlab-Simulink environment.

The first technical note 'Optimisation of the defroster ducts and windshield electric resistances of a city bus with CFD analysis' by O. Ünverdi et al. describes the windshield and side windows defrosting system performance of a low-floor city bus that can be improved considerably with CFD analysis. The second technical note 'Ride comfort optimisation of Ford cargo truck cabin' by O. Tuncel et al. presents research to improve the cabin suspension elements (suspension springs and shock absorbers) in order to achieve the design objectives. The third technical note 'Remodelling, design and testing of a steering system for improvement of the characteristics' by B. Yelken and C. Çogun describes a design map to guide the design of a complete steering system of a bus for design engineers. The fourth technical note 'Vehicle interior noise source contribution and transfer path analysis' by F.O. Tandoğan and A. Güney investigates potential interior

noise problems by the interior noise source contribution and transfer path analysis for vehicles.

The fifth conference in the series, OTEKON 2010, will be held on 7–8 June 2010 in Bursa, Turkey. It will focus on the development of innovative and intelligent vehicle concepts to meet the requirements of the future. Further enhancements of vehicle technology and energy use issues for sustainable mobility must be achieved in the automotive world. The automobile of the future will have to face the challenges to ensure sustainable mobility. We are pleased to invite you to join us as participants from academia and industry to take part and exchange knowledge.

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