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ADVANCED VEHICLE TECHNOLOGIES"

6th International Conference on Multibody Systems, Nonlinear Dynamics, and Control (MSNDC)

**2007 ASME International Design Engineering Technical Conference (IDETC)
September 4-7, 2007, Rio All-Suite Hotel & Casino, Las Vegas, Nevada, USA**

Sponsored by: Vehicle Design Committee

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Technical Research Areas:

The Vehicle Design Committee of the ASME Design Engineering Division is organizing a symposium entitled "Advanced Vehicle Technologies". Papers are invited on innovative analytical, computational, and experimental investigations in control, dynamics, and design of full vehicle systems and their sub-assemblies. Papers may address fundamental research, applied research, or successful implementations relating to light or heavy vehicle design and development. Seven sessions will be organized as follows:

Session 1: Advances in Methods for Vehicle Systems Design and Control

Topics include optimal, reliable, and robust design of vehicles and their systems and subsystems, design of integrated (mechatronics) systems, and engineering applications referring to vehicle design.

Chair:	**Professor Massimiliano Gobbi**
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Session 2: Advances in Vehicle Systems Product Development

Papers in the area of product development, as it applies to the vehicle manufacturing industry, are solicited. Topics include, but are not limited to, design target setting, business case analysis, reliability and maintenance issues, cost models, impact analysis of novel and advanced technologies, market uncertainty and demand modeling.

Chair:	**Dr. Brian Gilmore**
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Session 3: Advances in Vehicle Design Tools to Enhance Safety, Health, and Ergonomics

A number of vehicle design tools such as finite element and biomechanics dynamics programs are used to design safety and health enhancements that reduce the probability and intensity of injuries in vehicle crashes. Topics will include finite elements to study the validity and accuracy of crush-based accident analysis, the design of seats with airbag and seatbelt system integrations and robust structures that protect occupants during impacts, the response of the human body to vibration and mechanical shocks, and general means for improving crashworthiness of vehicles and biomechanics studies.

Chair	**Prof. Yin-Ping (Daniel) Chang**
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Session 4: Advances in Safety Applications of Vehicle Design Tools

Topics will include advanced multibody systems modeling methods and algorithms that enable a more efficient, accurate and improved vehicle mobility and dynamic performance prediction. Experimental evaluation and model validation tests are also topics of interest. Some example topics include: full or subsystem vehicle modeling, tire modeling, advanced analytical and computational methods and algorithms, uncertainty modeling, damping modeling, new equipment and new methodologies developed for testing vehicles and vehicle systems.

Chair :   **Dr. Mohamed Kamel Salaani**
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Co-chair: **Dr. Jeong-Hoi Koo**
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Session 5: Advances in Multibody Systems Modeling and Validation for Vehicle Dynamics Applications

Topics will include advanced multibody systems modeling methods and algorithms that enable a more efficient, accurate, and improved vehicle mobility and dynamic performance prediction. Experimental evaluation and model validation tests are also topics of interest. Other example topics include: full or subsystem vehicle modeling, tire modeling, advanced analytical and computational methods and algorithms, uncertainty modeling, damping modeling, new equipment and new methodologies developed for testing vehicles and vehicle systems.

Chair: **Dr. Corina Sandu**
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Session 6: Advances in Vehicle Systems Dynamics and Control

Papers in the general area of Dynamics and Controls applications to vehicle systems are welcome. Topics include integrated design, modeling, analysis, and experimental testing of ABS systems with load shifting, active and semi-active suspensions for improving vehicle ride and handling, intelligent rollover warning systems, active yaw control systems for on- and off-road vehicles, and advanced propulsion control systems for improving fuel economy, emission control and drivability for both passenger and commercial vehicles.

Chair   **Dr. Mohammad Elahinia**
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Session 7: Advances in non-conventional, energy efficient and environmentally friendly vehicles

The recent hikes in fuel prices as well as growing environmental concerns have drawn renewed interest on research and development of more energy efficient vehicles. While electric and hybrid electric vehicles (EV/HEV) have seen some market success, significant progress is also being made with fuel cell vehicles (FCV), hydraulic hybrid vehicles (HHV), and solar (photovoltaic cell) powered vehicles. This session emphasizes but is not limited to the design, analysis and optimization of EVs, HEVs, HHVs, FCVs and solar cell powered vehicles. Examples of topics include innovative controls and energy management strategies; new component or sub-assembly designs for HEV/EV/FCV/HHVs, including power electronics and electrochemical/hydro-pneumatic energy storage systems; hydrogen storage systems; PV cell design and optimization, thermal stress management; regenerative braking systems; implications to vehicle dynamics, safety and reliability; and the analysis of environmental impact.

Chair: **Dr. Joel Anstrom**
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