MULTIDISCIPLINARY PROBLEM OF MBD ON AUTOMOTIVE SYSTEM

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ABSTRACT

MultiBody Dynamics (MBD) techniques have been applied to practical vehicle designs and evaluations of many performances, such as, safety, drivability, comfortableness, reliability and efficiency. These design problems require multi-physics analysis by combining MBD with biomechanics, fluid dynamics, control and electromagnetics. For instance, driver behavior related to vehicle drivability is analyzed by a human-machine system which consists of a human musculoskeletal model and a MBD model of a vehicle mechanism. In efficiency or reliability analysis of power train systems, a coupling model of fluid lubrication and MBD is developed to predict the bearing friction or the stress of the mechanical parts. In this talk, these multidisciplinary approaches and design applications are introduced with trends of the key technologies related.

Dr. Noboru Kikuchi is a Professor of the Mechanical Engineering and Applied Mechanics in the Computational Mechanics Laboratory, The University of Michigan. He earned his Doctorate degree from University of Texas in 1977. He was an Assistant Professor from 1980 to 1983, and was an Associate Professor at The University of Michigan from 1983 to 1985. He has been a Professor at The University of Michigan since 1985. He received nine Honors and Awards, in which the recent ones were Distinguished Research Award from Engineering College of The University of Michigan in 1991, Outstanding Research Award from Department of Mechanical Engineering and Applied Mechanics in The University of Michigan in 1993, and The Best Paper Award from ASME Design and Automation Conference in 1993. He published more than 150 journal papers and textbooks. His research interests are the adaptive finite element method including automatic mesh generation and re-meshing schemes for nonlinear problems in mechanical engineering and applied mechanics.