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Seminar über Fragen der Mechanik

zu folgendem Vortrag wird herzlich eingeladen

Montag, **13.01.2014, 10:00 Uhr**, Haberstraße 1, Raum 01.025

Multibody Dynamics Methodologies with Applications to Biomechanics and Vehicle Dynamics

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Multibody dynamics plays an important role in the computational analysis of systems undergoing large motion. Vehicles, deployable structures, machines, biomechanical systems or flexible manipulators exemplify systems that, while interacting with external sources, have their dynamics conditioned by the relative kinematics between their components. Initially restricted to the treatment of rigid bodies, the multibody methods are now also used to describe the components linear or nonlinear deformations by incorporating finite element approaches. The ease of including descriptions of the contact problems, control paradigms or equations of equilibrium of other disciplines in the multibody models is demonstrated here to show the flexibility of these approaches. The optimization methodologies, in the framework of multibody dynamics, provide powerful tools for analysis, design or model construction. For different systems or applications not only the types of objective functions and constraints have to be identified but also the optimization methods to apply have to be carefully selected. Here the analysis or design of several complex multibody systems with industrial relevance, such as road and railway vehicles in crash scenarios and satellite structures for increased stiffness, or biomedical relevance, such as injury biomechanics or evaluation of muscle forces of the human motion tasks, are presented and discussed to support and demonstrate the multibody and finite element methodologies.

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