

## **Multithreading/Multiprocessing Simulation of The International Space Station Multibody System Using A Divide and Conquer Dynamics Formulation with Flexible Bodies**

**Authors :** Luong A. Nguyen, Elihu Deneke, Thomas L. Harman

**Abstract :** This paper describes a multibody dynamics algorithm formulated for parallel implementation on multiprocessor computing platforms using the divide-and-conquer approach. The system of interest is a general topology of rigid and elastic articulated bodies with or without loops. The algorithm is an extension of Featherstone's divide and conquer approach to include the flexible-body dynamics formulation. The equations of motion, configured for the International Space Station (ISS) with its robotic manipulator arm as a system of articulated flexible bodies, are implemented in separate computer processors. The performance of this divide-and-conquer algorithm implementation in multiple processors is compared with an existing method implemented on a single processor.

**Keywords :** multibody dynamics, multiple processors, multithreading, divide-and-conquer algorithm, computational efficiency, flexible body dynamics

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