

A Spatial Operator Algebra for Computational Multibody Dynamics

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Abstract: (paper to be presented at SciCAD97)

The *Spatial Operator Algebra (SOA)* is a mathematical framework for the analysis of the dynamics of multibody mechanical systems. Multibody systems consist of rigid and elastic bodies whose relative motion is constrained by hinges between the bodies. Examples of such systems include spacecraft, robots, vehicles, mechanisms, molecular models and others. Based upon mathematical analogs to the field of optimal estimation, the SOA provides new operator tools that help in the analysis of the dynamics of multibody systems, as well as the development of efficient computational algorithms for simulation applications. This paper provides an overview of the interplay between theoretical insights obtained using the spatial operators, and the development of efficient recursive computational algorithms.

(This talk will be covering material that, has already been published in the open literature and been cleared in the past by Document Review.)