MAE Praxair Special Seminar

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"A Journey through Multibody Dynamics with the DeNOC Matrices"

The presentation covers the methodologies used to write the dynamic equations of motion of serial, parallel, and closed-chain multibody systems like an industrial robot, a parallel Stewart-platform like manipulators, and others. In the context of multi-body dynamics modeling, a concept called the Decoupled Natural Orthogonal Complement (DeNOC) matrices have been introduced by the speaker in 1995 that has originated in 1989 with the name Natural Orthogonal Complement (NOC). So far, the DeNOC has been applied to several serial and parallel rigid body systems, and found suitable, particularly, for forward dynamics where the recursive algorithms provided efficient and stable algorithms. An in-house software for Windows user, called Recursive Inverse Dynamics for Industrial Manipulators (RIDIM) based on the DeNOC is presently in use at IIT Delhi for Robotics, Mechatronics, and Multibody Dynamics courses offered to UG and Graduate students. The interface of another algorithm for forward dynamics with the RIDIM is underway. Besides, the DeNOC is getting explored for flexible-body system modeling and the constrained force evaluation as well.

206 Furnas Hall
Tuesday, April 12, 2005
Refreshments – 3:00 pm
Seminar 3:30 pm – 4:30 pm