

“Advanced Modeling and Simulation  
Techniques for Multibody Robotic Systems”

Bonnie Yue (Maplesoft)

Monday, 14 May 2012

0900-1200

Room 12 – St. Paul River Centre

**Abstract:** Developments in advanced model formulation techniques and efficient model simulation algorithms, together with ever-increasing computational power, have enabled the proliferation of advanced robotics research. This workshop introduces novel techniques for efficiently developing high fidelity physical models of multibody robotic systems. Using symbolic computation, multibody models can be effectively preprocessed to select optimal coordinate frames, eliminate redundant calculations, simplify algebraic constraints and generate computationally efficient code for real-time deployment.

Applications in robotics, including space and industrial robotics will be presented. The symbolic computation system Maple and the related modeling system MapleSim will be used to illustrate examples.

**Bio:** Bonnie Yue is an Application Engineer at Maplesoft. She holds a M.A.Sc in mechanical engineering from the University of Waterloo. During her research, she collaborated with the Canadian Space Agency to develop a HIL platform for space rovers. Her paper for this work “Hardware-in-the-Loop for Power Level Estimation of Planetary Rovers” has been accepted for publication in the International Journal of Vehicle Autonomous Systems.