"How a Differential Equation Becomes a Robot: Expanding the power of MATLAB with Simulink and the Symbolic Math Toolbox"

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1300-1600
Room 12 – St. Paul River Centre

Register for this session at www.mathworks.com/icra2012

Abstract: The demonstration example will examine how a simple second order differential equation can evolve into a complex dynamic model of a multi-degree of freedom robotic manipulator that includes the controls, electronics and three-dimensional mechanics of the complete system. Starting from underlying mathematical and physical principles, we will discuss the iterative process of analysis, design and optimization involved in the development and implementation of a real-world practical application.

Highlights of the presentation will include:

- Using the Symbolic Computation to create equations of motion
- Modeling complex electro-mechanical systems using Simulink and the physical modeling libraries
- Using MATLAB scripts to control and automate the simulation of dynamic models in Simulink
- Importing three-dimensional mechanisms directly from CAD packages
- Creating virtual reality visualizations and interfacing with external input devices
- Prototyping and testing the complete real-time system in hardware with xPC Target

Bio: Carlos Osorio received a B.S. from the Pontificia Universidad Catolica del Peru and an M.S. from the University of California at Berkeley, both in Mechanical Engineering. He specializes in Automatic Control Systems and Vehicle Dynamics. Before joining MathWorks in October of 2007, he worked in the automotive industry in the Advanced Chassis Technology Department at Visteon Corporation, where he was involved in the development and implementation of prototype electronic active and semi-active suspensions, steer-by-wire and brake-by-wire systems for passenger vehicles.