INFORMS UH Lecture Series

SPRING 2008

presents

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Title: Bayesian Hierarchical Model for Integrating Multi-resolution Metrology Data

11:00 am -12:00 pm Friday, March 7, 2008
102 D, Eng. Building D2

ABSTRACT

This talk discusses a Bayesian hierarchical model to integrate multi-resolution metrology data for inspecting geometry quality of manufactured parts. Our treatment includes using a Gaussian process for modeling metrology data at a single resolution level and establishing a linkage model to connect datasets at different resolutions. A unique problem in this metrology application is the misalignment between the low- and high-resolution datasets. To address the misalignment issue, an optimization procedure is first employed to roughly align datasets of different resolutions and then a neighborhood linkage model is introduced to link a high-resolution data point with a group of low-resolution data points. The single-resolution model and the linkage model are incorporated into a Bayesian hierarchical framework and they produce a better prediction than using any individual dataset. Improvements are demonstrated using both simulated data and the datasets from a milled part of a sine-wave surface, measured by two coordinate measuring machines of different resolutions, respectively.

Details can be found at http://www.uh.edu/~informs/events/events.htm.
If you have any questions regarding this event, please contact Dr. Gino Lim at 713-743-4194 or at ginolim@uh.edu.