Department of Industrial & Systems Engineering, NUS, Singapore

SEMINAR on

*Reverse Engineering Algorithms to Discover Structural System Models from System Data*

**Speaker:** Nong Ye, Professor of Industrial Engineering, Arizona State University

**Date:** 24 June 2015 (Wednesday)

**Time:** 16:00 p.m. to 17:00 p.m.

**Venue:** EA-06-01, Faculty of Engineering, NUS

**Abstract:** Many complex systems exist without us knowing structural system models that drive system behaviors. Existing data mining techniques are inadequate in reverse engineering to discover structural system models from system data in a computationally efficient manner. This talk will present a new set of computationally efficient reverse engineering algorithms to discover structural system models from system data with categorical variables and/or numeric variables. These algorithms consist of steps for computing co-occurrence ratios for possible associative relations between values of variables and constructing a structural system model based on associative relations with high co-occurrence ratios. The reverse engineering algorithms have the advantage of supporting associative relations between certain values of variables and thus allowing different relations to be formed in different value ranges of variables rather than just one relation over all values of variables. The reverse engineering algorithms, their performance and scalability are described and demonstrated using a number of data sets, including energy consumption data and student retention data.

**Biography:** Nong Ye is a Professor of Industrial Engineering at Arizona State University. She holds a Ph.D. degree in Industrial Engineering from Purdue University, a M.S. degree in Computer Science from the Chinese Academy of Sciences, and a B.S. degree in Computer Science from Peking University. Her research interests are in data mining and systems engineering.

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