香港浸會大學理學院
HKBU Faculty of Science
50th Anniversary

HKBU
Computer Science Department
計 算 機 科 學 系

Department of Computer Science
Distinguished Lecture 2011 Series

Fusing Multiple Sources of Conflicting Information

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Dr. Eugene Santos, Jr. received his B.S. ('85) in Mathematics and Computer Science from Youngstown State University, M.S. ('86) in Mathematics (specializing in Numerical Analysis) from Youngstown State University, as well as Sc.M. ('88) and Ph.D. ('92) degrees in Computer Science from Brown University. His areas of research interest include artificial intelligence, intent inferencing, social and cultural modeling, computational social science, automated reasoning, decision science, adversarial reasoning, medical modeling and simulation, user modeling, natural language processing, probabilistic reasoning, knowledge engineering, and active user interfaces.

Dr. Santos is currently Editor-in-Chief for the IEEE Transactions on Systems, Man, and Cybernetics: Part B, and an associate editor for the International Journal of Image and Graphics. Dr. Santos serves on the editorial advisor board for System and Information Sciences Notes, and he is on the editorial boards for the Journal of Intelligent Information Systems and the Journal of Experimental and Theoretical Artificial Intelligence.

Date: November 8, 2011 (Tue)

Time: 2:30 p.m.

Venue: Lecture Theatre 1 (LT1), Ho Sin Hang Campus, HKBU

Abstract:

In this talk, I address the challenges of information/knowledge fusion from multiple (possibly conflicting) sources. For example, consider that there are multiple experts (sources) providing knowledge-based models of the same scenario/situation and we wish to aggregate this information in order to assist in decision-making. There are several problems we may run into by naively merging the information from each source – the experts may disagree on the probability (uncertainty) of a certain event or they may disagree on the direction of causality between two events (e.g., one thinks A causes B while another thinks B causes A); the experts may even disagree on the entire structure of dependencies among a set of variables in a (probabilistic) network. The challenge here is to develop a semantically sound and computationally effective methodology that explicitly accounts for the uncertainty and conflicts. In our solution to this problem, we represent the knowledge-based models as Bayesian Knowledge Bases (BKBs) and provide an algorithm called Bayesian knowledge fusion that allows the fusion of multiple BKBs into a single BKB that retains the information from all input sources. This allows for easy aggregation and de-aggregation of information from multiple expert sources and facilitates multi-expert/source decision making by providing a framework in which all opinions can be preserved and reasoned over.

*Sharing session with staff and students: November 10, 11:30 a.m., R905, HSH Campus

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