

## Compiling Weighted Constraint Satisfaction Problems to Minimum Weighted Vertex Cover Problems

**ABSTRACT** - The weighted constraint satisfaction problem (WCSP) is a fundamental combinatorial problem with applications in diverse areas such as artificial intelligence, statistical physics, computer vision, and information theory. In this talk, I will first present a method for compiling WCSPs to minimum weighted vertex cover (MWVC) problems. I will then present a number of benefits of doing so. Some of these benefits include: (a) a method to simultaneously exploit the structure of the variable-interactions in a given WCSP as well as the structure of the weighted constraints in it; (b) an efficient method to kernelize combinatorial problems; and (c) a framework for reviving distributed message passing algorithms on WCSPs.



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**SPEAKER BIO** – Prof. Satish Kumar Thittamaranahalli (T. K. Satish Kumar) leads the Collaboratory for Algorithmic Techniques and Artificial Intelligence at the Information Sciences Institute of the University of Southern California. He has published extensively on numerous topics in Artificial Intelligence spanning such diverse areas as Constraint Reasoning, Planning and Scheduling, Probabilistic Reasoning, Robotics, Combinatorial Optimization, Approximation and Randomization, Heuristic Search, Model-Based Reasoning, Knowledge Representation and Spatio-Temporal Reasoning. He has served on the Program Committees of many international conferences in Artificial Intelligence and is a winner of three Best Paper Awards in various categories from the International Conference on Automated Planning and Scheduling. Prof. Kumar received his PhD in Computer Science from Stanford University in March 2005. In the past, he has also been a Visiting Student at the NASA Ames Research Center, a Postdoctoral Research Scholar at the University of California, Berkeley, a Research Scientist at the Institute for Human and Machine Cognition, a Visiting Assistant Professor at the University of West Florida, and a Senior Research and Development Scientist at Mission Critical Technologies.

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