



**Speaker:** Despina Stasi  
Illinois Institute of Technology

Monday, November 18, 2013  
4:00 PM  
258 Hurley Hall

**Title:** Hydras: Horn formulas and directed hypergraphs

**Abstract:**

The problem of Horn formula minimization is of fundamental importance to various applications including knowledge representation and reasoning. Horn formula minimization is NP-complete for many notions of minimization. Motivated by approximation algorithms that make use of the minimum number of bodies in a Horn formula we consider the problem of determining minimal Horn formula size for a subclass of Horn formulas.

A hydra formula is a Horn formula consisting of size 3 definite Horn clauses, specified by a set of bodies of size 2, and containing clauses formed by these bodies and all possible heads. A hydra formula can be specified by the undirected graph formed by the bodies occurring in the formula. Thus minimal formula size for hydras can be considered as a graph parameter, the hydra number. We give various bound for the hydra number and discuss its connection to other quantities such as the path cover number of the line graph.

This seminar is being presented jointly with the Interdisciplinary Center for Network Science & Applications (iCeNSA).