Algorithms for normal forms of matrices of integers

George LABAHN

University of Waterloo

glabahn@uwaterloo.ca

Normal forms of integer matrices arise in many applications ranging from solving linear diophantine equations, classification of finite abelian groups and determining scaling invariants of dynamical systems, to name just a few. In this talk we will describe a number of new algorithms for computation of Smith and Hermite forms, the two best known classical forms. While these normal forms are not directly related to exponential analysis we will show that some of the ideas of recent algorithms are related to techniques that appear in matrix rational approximation, one of the topics closely connected to this conference.