Symbolic-numeric computing for Bohemian matrices

Robert M. Corless[1]   [rcorless@uwaterloo.ca]

[1] David R. Cheriton School of Computer Science, University of Waterloo

A Bohemian matrix family is a set of matrices each of whose entries comes from a fixed, usually finite integer, population. Questions about the eigenvalues of the entire family turn out to be interesting on several fronts, and numerical methods for computing the eigenvalues are valuable because they are efficient and stable in a backward error sense. However, to answer certain combinatorial questions, exact computation can be better, and even symbolic computation (especially of inverse eigenvalue problems) can be useful. In this talk we explore some examples and give a theorem about some rare but important errors in purely numerical computation. This is joint work with many people, including Aaron Asner and Mark Giesbrecht.

Keywords
Bohemian matrix, Eigenvalues of Bohemian matrices