

1117-05-58

Alex Fink, Jenna Rajchgot and Seth Sullivant* (smsulli2@ncsu.edu). *Matrix Schubert varieties and Gaussian conditional independence models.*

Matrix Schubert varieties are certain varieties in the affine space of square matrices which are determined by specifying rank conditions on submatrices. We study these varieties for generic matrices, symmetric matrices, and upper triangular matrices in view of two applications to algebraic statistics: we observe that special conditional independence models for Gaussian random variables are intersections of matrix Schubert varieties in the symmetric case. Consequently, we obtain a combinatorial primary decomposition algorithm for some conditional independence ideals. We also characterize the vanishing ideals of Gaussian graphical models for generalized Markov chains.

In the course of this investigation, we are led to consider three related stratifications, which come from the Schubert stratification of a flag variety. We provide some combinatorial results, including describing the stratifications using the language of rank arrays and enumerating the strata in each case. (Received December 29, 2015)