

Random Monomial Ideals

Lily Silverstein, University of California Davis

Probability is a now-classic tool in combinatorics, especially graph theory. Some applications of probabilistic techniques are: describing the typical/expected properties of a class of objects, uncovering phase transitions and sudden thresholds in the dependence of one property on another, and producing examples of extremal or conjectured objects. Random examples are also a great way to test your code, and to see patterns that become conjectures that become theorems.

I'll introduce some models for producing random monomial ideals, and results on some expected properties and thresholds. These models are implemented in the Macaulay2 package `RandomMonomialIdeals`, along with methods for generating statistics for open problems.