

Discrete Mathematics & Combinatorics

The random simplicial complex

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Simplicial complexes appear in many parts of mathematics and typically one is interested in some subclass of complexes with various "nice" properties. In the last decade there has also been active work on different models for random simplicial complexes. Two common models have been the Meshulam-Linial model and the complex of independent sets of an Erdős-Renyi random graph, both of which impose a fair amount of structure in the generated complexes.

In this talk I will discuss my recent work on the uniform random simplicial complex. Here we note that there is a finite number of simplicial complexes on n vertices and we want to give them all equal probability. We then present a model which makes it possible to compute probabilities for certain events under this distribution. This model thus answers questions about what a typical simplicial complex on n vertices looks like, and I will discuss some such properties and applications.

This is joint work with Trevor Pinto.