Random Intersection Graphs

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In most models of random graphs, the edges enjoy all the attention and the vertices are passive bystanders. In Erdős-Rényi random graph, we are given n vertices and flip coins to see where the edges go—the appearance of one edge is independent of any other. Such a model is useful when the "relations" between "objects" are independent of one another.

In this talk, we explore a model of random graphs in which the vertices are the focus. We independently assign to each vertex a random structure and then assess the adjacency of two vertices by comparing their assigned structures. To do this, we use the concept of an *intersection graph*.

Let G be a (finite, simple) graph. We say that G is an *intersection graph* if we can assign to each vertex $v \in V(G)$ a set S_v so that $vw \in E(G)$ exactly when $S_v \cap S_w \neq \emptyset$. In this case, we say G is the intersection graph of the family of sets $\mathcal{S} = \{S_v : v \in V(G)\}$. If the sets from $\mathcal{S}$ are generated in some random way than we say that G is random intersection graphs (see [1]).

In the last few years, random intersection graphs enjoy extensive attention both from theoretical and application point of view. We shall briefly sketch recent developments in this area. Next, we concentrate on results dealing with asymptotic distributions of certain characteristics of generalized random intersection graphs (see [2]).

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References

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