

Random graphs and its applications for networks

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Random graphs and Bradley-Terry model in random environment

We consider a model of paired comparisons represented by an oriented random graph. Each vertex corresponds to a compared element and an oriented edge between two vertices describes the result of the comparison. A weight is associated to each vertex and the set of non-oriented edges is fixed but the orientation of each edge is randomly chosen according to the Bradley-Terry model and depends on the weights of the two vertices. In addition, the different weights are assumed to be drawn i.i.d. at random. We will examine two questions about this model. First in a tournament, that is an orientation of a complete graph, is the vertex with the highest weight also the vertex with the highest indegree?

A second problem will be to try to obtain informations on the distribution of the weights by considering only the orientation of a small number of edges.