Institut für Diskrete Mathematik

Vortrag im Seminar für Kombinatorik und Optimierung

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On the spectral gap of random hyperbolic graphs

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Random hyperbolic graphs have been suggested as a promising model of social networks. We consider the random hyperbolic graph model as formalized by Gugelmann et al. and essentially determine the spectral gap of the normalized Laplacian. Specifically, we establish that a.a.s. the second smallest eigenvalue of the normalized Laplacian of the giant component of the random hyperbolic graph is $\Omega(n^{-(2\alpha-1)}/(n))$, where $\frac{1}{2} < \alpha < 1$ is a model parameter. As a byproduct we conclude that the conductance upper bound on the eigenvalue gap obtained via Cheeger's inequality is essentially tight. We also provide a more detailed picture of the collection of node on which the bound on the conductance is attained.

Joint work with Marcos Kiwi.

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