

Publications of Janosch Ruff

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Conference papers

- [1] Bläsius, T., Friedrich, T., Katzmann, M., Ruff, J., Zeif, Z., [On the Giant Component of Geometric Inhomogeneous Random Graphs](#). In: *European Symposium on Algorithms (ESA)*, pp. 20:1–20:13, 2023.

In this paper we study the threshold model of geometric inhomogeneous random graphs (GIRGs); a generative random graph model that is closely related to hyperbolic random graphs (HRGs). These models have been observed to capture complex real-world networks well with respect to the structural and algorithmic properties. Following comprehensive studies regarding their connectivity, i.e., which parts of the graphs are connected, we have a good understanding under which circumstances a giant component (containing a constant fraction of the graph) emerges. While previous results are rather technical and challenging to work with, the goal of this paper is to provide more accessible proofs. At the same time we significantly improve the previously known probabilistic guarantees, showing that GIRGs contain a giant component with probability $1 - \exp(-\Omega(n^{(3-\tau)/2}))$ for graph size n and a degree distribution with power-law exponent $\tau \in (2, 3)$. Based on that we additionally derive insights about the connectivity of certain induced subgraphs of GIRGs.