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On the edit distance function of the random graph.

Given a hereditary property of graphs $\mathcal{H}$ and a $p \in [0, 1]$, the edit distance function $ed_{\mathcal{H}}(p)$ is asymptotically the maximum proportion of edge-additions plus edge-deletions applied to a graph of edge density $p$ sufficient to ensure that the resulting graph satisfies $\mathcal{H}$. The edit distance function is directly related to other well-studied quantities such as the speed function for $\mathcal{H}$ and the $\mathcal{H}$-chromatic number of a random graph.

Let $\mathcal{H}$ be the property of forbidding an Erdős-Rényi random graph $F \sim \mathbb{G}(n_0, p_0)$, and let $\varphi$ represent the golden ratio. In this paper, we show that if $p_0 \in [1 - 1/\varphi, 1/\varphi]$, then a.a.s. as $n_0 \to \infty$,

$$ed_{\mathcal{H}}(p) = (1 + o(1)) \frac{2 \log n_0}{n_0} \cdot \min \left\{ \frac{p}{-\log(1 - p_0)}, \frac{1 - p}{-\log p_0} \right\}. $$

Moreover, this holds for $p \in [1/3, 2/3]$ for any $p_0 \in (0, 1)$. (Received August 17, 2020)