

In the Letter [1] we studied the resilience of scale-free networks to intentional attack (deletion of the most highly connected nodes). Our main result is a formula for p_c — the fraction of most connected sites that must be removed before the network collapses — which follows from Eqs. (8) and (11) [1]:

$$p_c^{\frac{2-\alpha}{1-\alpha}} - 2 = \frac{2-\alpha}{3-\alpha} m (p_c^{\frac{3-\alpha}{1-\alpha}} - 1). \quad (1)$$

This was derived under the assumption that $P(k)$, the probability that a site has k connections, is modeled by the *continuous* distribution

$$P(k) = ck^{-\alpha}, \quad m \leq k \leq K, \quad (2)$$

where c is a normalization constant, and m and K are lower and upper cutoffs for the site connectivity, respectively. In practice, though, a site may only have an *integer* number of connections. Indeed, in our simulations [1] we have used the *discrete* distribution

$$P_I(k) = \int_{k-1/2}^{k+1/2} P(q) dq. \quad (3)$$

The analytical formula of Eq. (1) provides an excellent approximation to results from simulations performed with the distribution $P_I(k)$, see Fig. 1 [1].

The comment’s main claim is that in [1] we did not compare our results to the discrete distribution [2,3]:

$$P_{II}(k) = k^{-\alpha}/\zeta(\alpha), \quad k = 1, 2, \dots \quad (4)$$

Following our theory, the authors of the comment show that p_c , for the distribution $P_{II}(k)$, is given by the solution to the set of equations:

$$\sum_{k=1}^{\tilde{K}(p_c)} k^{2-\alpha} = \zeta(\alpha - 1) + \sum_{k=1}^{\tilde{K}(p_c)} k^{1-\alpha}, \quad (5a)$$

$$p_c = 1 - \sum_{k=1}^{\tilde{K}(p_c)} k^{-\alpha}/\zeta(\alpha). \quad (5b)$$

Because the authors of the comment regard the distribution $P_{II}(k)$ as “original” compared to $P_I(k)$, they view

with alarm the differences in p_c obtained from the two distributions.

We observe that: (a) P_I and P_{II} are equal, asymptotically, in the limit of large k , and (b) the differences are most pronounced for $k \approx m$, where $P_I(1)$ is quite smaller than $P_{II}(1)$. The difference in p_c between our approach and Ref. [3] are mainly due to the values of $P(k)$ for small k and are not related to the type of approximation, continuous or discrete. More details will be forthcoming [4].

Moreover, we strongly disagree that, in the context of the Internet, P_{II} is more original than P_I . While it has been firmly established that $P(k) \sim k^{-\alpha}$ for large k [5], which is valid for both $P_I(k)$ and $P_{II}(k)$, the distribution for small k has not been explored. In this limit, the distribution is most fluid, due to computers connecting and detaching from the net. Our aim in [1] has been merely to explore the effect of the scale-free tail (at large k).

Surely, the simplicity of Eq. (1), vis a vis Eqs. (5), more than makes up for any conceivable aesthetic advantage of P_{II} over P_I . The use of the distribution P_I (and its continuous analogue) is more than worthwhile!

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[1] R. Cohen, K. Erez, D. ben-Avraham, and S. Havlin, *Phys. Rev. Lett.* **86**, 3682 (2000).

[2] Note that the comment specializes to lower cutoff $m = 1$.

[3] D. S. Callaway, M. E. J. Newman, S. H. Strogatz, and D. J. Watts, *Phys. Rev. Lett.* **85**, 5468 (2000).

[4] R. Cohen *et al.*, *preprint*.

[5] M. Faloutsos, P. Faloutsos, and C. Faloutsos, *ACM SIGCOMM '99 Comput. Commun. Rev.* 29, 251 (1999).

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