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Braess's Paradox in Sparse Random Graphs

Braess's paradox is the counter-intuitive observation that closing roads can improve traffic flow. With the explosion of distributed (selfish) routing situations this paradox has become an important concern in a broad range of network design situations. However, the previous theoretical work on Braess's paradox has focused on dense or "designer" graphs, which are unrealistic in practical situations. We show that Braess's paradox occurs in $G(n, p)$ when $np \geq c \log(n)$. Joint work with Fan Chung.