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**Winning consensus on social networks**[1] SAMEET SREENIVASAN, Dept. of Physics and Dept. of Computer Science, Rensselaer Polytechnic Institute, NY, J. XIE, Dept. of Computer Science, Rensselaer Polytechnic Institute, NY, G. KORNISS, Dept. of Physics, Rensselaer Polytechnic Institute, NY, BOLESLAW SZYMANSKI, Dept. of Computer Science, Rensselaer Polytechnic Institute, NY
— The adoption of a specific behavior (opinion) by a population of individuals is influenced dramatically by the social network through which the individuals interact. Here, we show the conditions under which a randomly distributed sub-population of committed agents – nodes on the network that consistently profess a unique opinion and are not influenceable to change – can win over an entire population of individuals initially opposed to that opinion. We model the opinion dynamics by a variant of the Naming Game (Baronchelli et al. (2006)), which effectively captures the persistence of dominant opinions. Given this model, we demonstrate that in the asymptotic network size limit, there exists a critical value $p_c$ of the fraction of committed agents, above which the network-state attains consensus, and below which the network-state converges to a non-consensus fixed point. We also discuss finite size corrections to $p_c$ and the scaling of consensus times for finite networks.

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