Complex Contagion and The Weakness of Long Ties in Social Networks: Revisited

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Abstract:

It is a common understanding that the diffusion of disease and information is fast in social networks, due to the existence of weak ties and the property of a small network diameter. However, recently sociologists started to study complex contagions, in which node activation requires multiple active neighbors. Weak ties are not as effective in spreading such complex contagions due to the lack of simultaneously active contacts. Here, their role relies heavily on the way they are distributed in the network. In this talk we study several small world models and provide rigorous analysis on the diffusion speed of a complex contagion. The main result is that complex contagion can still be fast (in polylogarithmic time) on Kleinberg's small world model but would be slow if the weak ties are not distributed properly as in a Newman Watts Model. This is joint work with Golnaz Ghasemiesfeh and Roozbeh Ebrahimi, Stony Brook University.

Bio:

Jie Gao is currently an Associate Professor in the Computer Science Department at Stony Brook University. She received a BS from the special class for the gifted young program at the University of Science and Technology of China in 1999 and the Ph.D in Computer Science from the Computer Science Department at Stanford University in 2004. She received an NSF Career award in 2006.