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Entropy of dynamical social networks KUN ZHAO, Northeastern University, MARTON KARSAI, Aalto University, Finland, GINESTRA BIANCONI, Northeastern University — Dynamical social networks are evolving rapidly and are highly adaptive. Characterizing the information encoded in social networks is essential to gain insight into the structure, evolution, adaptability and dynamics. Recently entropy measures have been used to quantify the information in email correspondence, static networks and mobility patterns. Nevertheless, we still lack methods to quantify the information encoded in time-varying dynamical social networks. In this talk we present a model to quantify the entropy of dynamical social networks and use this model to analyze the data of phone-call communication. We show evidence that the entropy of the phone-call interaction network changes according to circadian rhythms. Moreover we show that social networks are extremely adaptive and are modified by the use of technologies such as mobile phone communication. Indeed the statistics of duration of phone-call is described by a Weibull distribution and is significantly different from the distribution of duration of face-to-face interactions in a conference. Finally we investigate how much the entropy of dynamical social networks changes in realistic models of phone-call or face-to face interactions characterizing in this way different type human social behavior.

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