

Abstract Submitted  
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**Epidemics in Complex Networks: The Diversity of Hubs** MAKSIM KITSACK, Boston University, LAZAROS K. GALLOS, The City College of New York, SHLOMO HAVLIN, Bar-Ilan University, H. EUGENE STANLEY, Boston University, HERNAN A. MAKSE, The City College of New York — Many complex systems are believed to be vulnerable to spread of viruses and information owing to their high level of interconnectivity. Even viruses of low contagiousness easily proliferate the Internet. Rumors, fads, and innovation ideas are prone to efficient spreading in various social systems. Another commonly accepted standpoint is the importance of the most connected elements (hubs) in the spreading processes. We address following questions. Do all hubs conduct epidemics in the same manner? How does the epidemics spread depend on the structure of the network? What is the most efficient way to spread information over the system? We analyze several large-scale systems in the framework of of the susceptible/infective/removed (SIR) disease spread model which can also be mapped to the problem of rumor or fad spreading. We show that hubs are often ineffective in the transmission of virus or information owing to the highly heterogeneous topology of most networks. We also propose a new tool to evaluate the efficiency of nodes in spreading virus or information.

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