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Controlling Contagion Processes in Time Varying Networks SUYU LIU, NICOLA PERRA, MARTON KARSAI, ALESSANDRO VESPIGNANI, Laboratory for the Modeling of Biological and Socio-Technical Systems,Northeastern University — The vast majority of strategies aimed at controlling contagion and spreading processes on networks consider the connectivity pattern of the system as quenched. In this paper, we consider the class of activity driven networks to analytically evaluate how different control strategies perform in time-varying networks. We consider the limit in which the evolution of the structure of the network and the spreading process are simultaneous yet independent. We analyze three control strategies based on node's activity patterns to decide the removal/immunization of nodes. We find that targeted strategies aimed at the removal of active nodes outperform by orders of magnitude the widely used random strategies. In time-varying networks however any finite time observation of the network dynamics provides only incomplete information on the nodes' activity and does not allow the precise ranking of the most active nodes as needed to implement targeted strategies. Here we develop a control strategy that focuses on targeting the egocentric time-aggregated network of a small control group of nodes.The presented strategy allows the control of spreading processes by removing a fraction of nodes much smaller than the random strategy while at the same time limiting the observation time on the system.

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