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Controlling Contagion Processes in Time-Varying Networks NICOLA PERRA, Northeastern University, SUYU LIU, Zhejiang University, MARTON KARSAI, ALESSANDRO VESPIGNANI, Northeastern University — The vast majority of strategies aimed at controlling contagion processes on networks considers the connectivity pattern of the system as either quenched or annealed. However, in the real world many networks are highly dynamical and evolve in time concurrently to the contagion process. Here, we derive an analytical framework for the study of control strategies specifically devised for time-varying networks. We consider the removal/immunization of individual nodes according the their activity in the network and develop a block variable mean-field approach that allows the derivation of the equations describing the evolution of the contagion process concurrently to the network dynamic. We derive the critical immunization threshold and assess the effectiveness of the control strategies. Finally, we validate the theoretical picture by simulating numerically the information spreading process and control strategies in both synthetic networks and a large-scale, real-world mobile telephone call dataset.

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