

Abstract Submitted
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Reliability theory for diffusion processes on interconnected networks YASAMIN KHORRAMZADEH¹, Department of Physics, Virginia Tech, Blacksburg, Virginia 24061, MINA YOUSSEF, Network Dynamics and Simulation Science Laboratory, Virginia Bioinformatics Institute, Virginia Tech, Blacksburg, Virginia 24061, USA, STEPHEN EUBANK², Network Dynamics and Simulation Science Laboratory, Virginia Bioinformatics Institute, Virginia Tech, Blacksburg, Virginia 24061, USA — We present the concept of network reliability as a framework to study diffusion dynamics in interdependent networks. We illustrate how different outcomes of diffusion processes, such as cascading failure, can be studied by estimating the reliability polynomial under different reliability rules. As an example, we investigate the effect of structural properties on diffusion dynamics for a few different topologies of two coupled networks. We evaluate the effect of varying the probability of failure propagating along the edges, both within a single network as well as between the networks. We exhibit the sensitivity of interdependent network reliability and connectivity to edge failures in each topology.

¹Network Dynamics and Simulation Science Laboratory, Virginia Bioinformatics Institute, Virginia Tech, Blacksburg, Virginia 24061, USA

²Department of Physics, Virginia Tech, Blacksburg, Virginia 24061, USA. Department of Population Health Sciences, Virginia Tech, Blacksburg, Virginia 24061, USA

Yasamin Khorramzadeh
Department of Physics, Virginia Tech, Blacksburg, Virginia 24061

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