Network Robustness from an Information Theory Perspective

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Abstract. A crucial challenge in network theory is the study of the robustness of a network when facing a sequence of failures. We propose a novel methodology to measure the robustness of a network to component failures or targeted attacks based on Information Theory, that considers measurements of the structural changes caused by failures of the network's components providing a dynamical information about the topological damage. The methodology is comprehensive enough to be used with different probability distributions and provides a dynamic profile that shows the response of the network's topology to each event, quantifying the vulnerability of these intermediate topologies.