

Abstract Submitted
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Extraction of hidden information by efficient community detection in networks¹ JOOYOUNG LEE, JUYONG LEE, Korea Institute for Advanced Study, STEVEN GROSS, University of California, Irvine — Currently, we are overwhelmed by a deluge of experimental data, and network physics has the potential to become an invaluable method to increase our understanding of large interacting datasets. However, this potential is often unrealized for two reasons: uncovering the hidden community structure of a network, known as community detection, is difficult, and further, even if one has an idea of this community structure, it is not a priori obvious how to efficiently use this information. Here, to address both of these issues, we, first, identify optimal community structure of given networks in terms of modularity by utilizing a recently introduced community detection method. Second, we develop an approach to use this community information to extract hidden information from a network. When applied to a protein-protein interaction network, the proposed method outperforms current state-of-the-art methods that use only the local information of a network. The method is generally applicable to networks from many areas.

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