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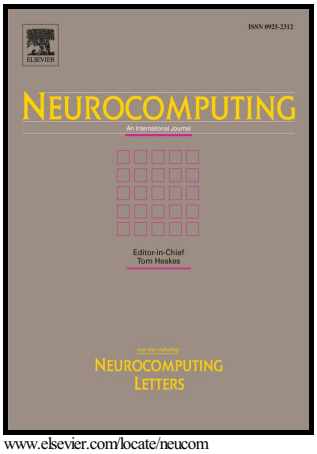


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# Uncovering Fuzzy Communities in Networks with Structural Similarity

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**Abstract**

Community detection is an important task for uncovering underlying structures and and analyzing group behavior in complex networks. A fuzzy community detection method is proposed in this paper, to detect fuzzy community structures without any prior knowledge. Compared with previous studies, we introduce a structural similarity to measure fuzzy relation between vertices based on local interactions between neighboring vertices. In our method, we take the fuzzy similarity between vertices and fuzzy transitivity of the similarity in network topology into consideration. Moreover, multiresolution community structures can be detected by varying the fuzzy threshold. Experimental results and comparisons with some state-of-the-art methods are presented for a variety of benchmark graphs. It shows that the method is efficient in detecting communities in both real-world and synthetic networks.

*Keywords:* Community detection, Fuzzy community, Structural similarity, Fuzzy clustering, Benchmark graph



## 1. Introduction

Complex networks are a natural representation of various complex systems in many fields such as society, biology and Internet [1, 2]. The research on com-

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