

# Community Detection in Online Social Networks: A Survey

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## ABSTRACT

Social network analysis (SNA) is the examination of social networks to comprehend participant behaviour and organisation. With heterogeneity and interdependencies posing as a major challenge, social network analysis (SNA) acts as a sustainable technique to study large-scale complicated social interactions. It offers quantitative techniques and topological metrics to analyse a network's topology in order to support transdisciplinary applications. Modern mobile technology has made it possible for people to express themselves freely on social media. This leads to a great deal of discussion, which finally creates the foundation for in-depth investigation and analysis. The ability to communicate quickly and affordably has greatly increased human interaction worldwide, regardless of place or time. A network of social contacts or personal relationships has been created as a result, and it is large and extremely diverse. An important problem in social networking analysis is community detection. One of the main areas of study for social network analysis is finding communities. Communities that are found through social networks enable their users to communicate with relatable people who share their interests. However, the massive expansion of social networks today necessitates a thorough analysis of current work done to uncover the community detection in social networks. This research compares the most popular optimization technique in the field of CD with recent methods that have been deployed. The application areas where CD techniques have been applied are also described. This directs



and motivates scientists to explore and advance their work in the field of identifying communities in social networks. Virtual clusters or communities are created as a result of people's propensity to connect in social networks when they comparable preferences, choices, and tastes. Finding these communities can be useful for a variety of applications, including discovering a shared research area in collaboration networks, discovering a group of users who share similar interests for marketing and recommendation purposes, and discovering protein interaction networks in biological networks. In the literature, numerous community detection techniques have been put out and used in a variety of fields. This paper provides an overview of the current methods and algorithms for identifying communities in social networks. We also go over a few of the users for community detection.

**Keywords:** community detection; social networks; network analysis