



# Mapping of Interconnected Social Groups in online Networks and Exploring Digital Spaces for community detection

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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. This paper delves into the intricate digital landscapes of online social networks, aiming to elucidate the interconnectedness among social groups within these dynamic spaces. Through an exploratory investigation, we employ advanced network analysis techniques to map out the intricate web of connections that define the social fabric of digital platforms. By scrutinizing the structural characteristics of these networks, we uncover clusters and communities that delineate the underlying social groups and their interactions. Our findings shed light on the complex dynamics of online social behaviour, offering insights into the formation, evolution, and interplay of interconnected social groups in digital spaces. This study not only enhances our understanding of online social networks but also provides valuable implications for various fields, including sociology, computer science, and digital marketing. An important problem in social networking analysis is community detection.

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## Introduction:

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,

