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	abstract	A community reveals the features and connections of its members that are different from those in other communities in a network. Detecting communities is of great significance in network analysis. Despite the classical spectral clustering and statistical inference methods, we notice a significant development of deep learning techniques for community detection in recent years with their advantages in handling high dimensional network data. Hence, a comprehensive overview of community detection's latest progress through deep learning is timely to academics and practitioners. This survey devises and proposes a new taxonomy covering different state-of-the-art methods, including deep learning-based models upon deep neural networks, deep nonnegative matrix factorization and deep sparse filtering. The main category, i.e., deep neural networks, is further divided into convolutional networks, graph attention networks, generative adversarial networks and autoencoders. The survey also summarizes the popular benchmark data sets, evaluation metrics, and open-source implementations to address experimentation settings. We then discuss the practical applications of community detection in various domains and point to implementation scenarios. Finally, we outline future directions by suggesting challenging topics in this fast-growing deep learning field.	**abstract**	Detecting a community in a network is a matter of discerning the distinct features and connections of a group of members that are different from those in other communities. The ability to do this is of great significance in network analysis. However, beyond the classic spectral clustering and statistical inference methods, there have been significant developments with deep learning techniques for community detection in recent years--particularly when it comes to handling high-dimensional network data. Hence, a comprehensive review of the latest progress in community detection through deep learning is timely. To frame the survey, we have devised a new taxonomy covering different state-of-the-art methods, including deep learning models based on deep neural networks (DNNs), deep nonnegative matrix factorization, and deep sparse filtering. The main category, i.e., DNNs, is further divided into convolutional networks, graph attention networks, generative adversarial networks, and autoencoders. The popular benchmark datasets, evaluation metrics, and open-source implementations to address experimentation settings are also summarized. This is followed by a discussion on the practical applications of community detection in various domains. The survey concludes with suggestions of challenging topics that would make for fruitful future research directions in this fast-growing deep learning field.		
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