ICETC原稿

Recommender committee name: Information Networks (IN) Presenter: Kohei Watabe Presenter Affiliation: Nagaoka University of Technology Presenter email: k_watabe@vos.nagaokaut.ac.jp

Title: Evolution and Future Prospects of Graph Generation Models

Abstract (200words): A graph is a versatile data structure used to represent various real-world phenomena abstractly. It consists of nodes (vertices) and edges (links), simplifying the representation of object relationships. The technique of synthetically generating graphs is crucial and has applications in various fields, including communication networks, social networks, transportation networks, databases, molecular engineering, and epidemiology. The problem of graph generation has been historically studied for a long time, and various generation models have been proposed. The common goal among them is to attempt to sample graphs with specific features from the vast space where graphs can potentially exist. While traditional approaches have focused on random-based generation, with the advancement of deep learning techniques, new generation methods called ``Deep Graph Generators'' have emerged. These methods learn and replicate the characteristics of real-world graph data. While many deep graph generators can only generate graphs with the same features as the given dataset, we have proposed GraphTune, which allows for the continuous specification of features. In this talk, we introduce representative graph generation models, including random-based models and deep graph generators, and also provide an overview of the basic idea and capability of GraphTune. Finally, we discuss the future developments of graph generation models.