Book Review

Individual and Collective Graph Mining: Principles, Algorithms and Applications

Dania Koutra and Christos Faloutsos
Synthesis Lectures on Data Mining and Knowledge Discovery

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As the graphs provide a more generic as well as a good representation of many types of data, there is a growing interest to apply it for big data analysis. Graphs tend to enhance the data mining techniques, and hence it acquired interests among data analysts. Visualizing this understanding, the authors Dania Koutra and Christos Faloutsos have brought out this work on Individual and Collective Graph Mining.

This book has seven chapters with the summary for further research and a good bibliography. In the introduction the authors have provided the overview and book content organization.

In the first part on Individual graph mining, the authors have addressed two issues. First is about the description of a large scale graph and second on what we deduce from the nodes. In the second part on collective graph mining, the authors provided a description of a large set of temporal graphs. Further they measured the similarity between graphs in which the nodes and edges are responsible. The last discussion is on how the two bipartite and unipartite graphs are aligned. The introduction also contains the various types and their definitions of graphs.

The second chapter on Summarization of Static Graphs include various descriptions relating to the graph summarization models, encoding, and vocabulary based summarization. Certain studies' results are also produced. The Inference in graph forms the third chapter and it addressed the nodes in a network and how they remain the network structure. The examples, techniques and features are more important components in this chapter.

In the second part, the chapter 4 begins with the summarization of dynamic graphs. This part is co-authored by Neil Shah. This unit begins with an excellent review and contributions of the graph summarization issues. The graph summarization is a compression problem with the Minimum Description Length. Encoding, application and results of the graph summation have followed the discussions.

The study of the difference in the graph and network connectivity is the crucial issue in the chapter on Graph Similarity. How the similarity and difference in connectivity between two graphs are studied here. The techniques to measure the similarity, the DELTACON is explained with the properties associated with such processing. The observations and sample data are also posted. In the last chapter on graph alignment the authors have posted the problems and optimization related to it. The last chapter has provided a brief indication of future possible directions for work followed by an extensive bibliography.

The work seems to be more comprehensive, simple as well as elegant. The main feature of the work is characterised by plentiful empirical data which supported the propositions presented.

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