Scalable Similarity Computation in Social Networks

We want to study the scalability of graph-based recommendation algorithms for large social networks and to propose methods for on-line recommendation. One important part of the work will be dedicated to optimizing the graph-based similarity scores, which involve the computation of paths between graph nodes. Some existing solutions split the graph into clusters of nodes and propose methods such that the random walk rarely cross the cluster boundaries and cause page faults. In order to reduce computation time, a simple solution would be to precompute and store on disk all pairwise similarity distances offline. Therefore, answering a similarity query online requires only a disk lookup. However, the space requirement is quadratic in the number of nodes in the graph, which is infeasible for current large social graphs. Existing works on distance labeling in graphs were shown to be efficient in rapidly estimating the shortest path distances in large graphs. Some other solutions, based on the usage of landmarks and sketches, which can be viewed as simplified distance labeling algorithms, were also proposed to efficiently estimate shortest paths.

The general idea of these solutions is to store at each node information, like typically a set of vertices and the distance from this node to every one on these vertices, such that the distance queries are answered by using this information. Efficient indexing schemes will allow to optimize the computation cost and to efficiently access the huge amount of data.

Informations complémentaires (Langue 2)

To validate our theoretical results, we intend to test our architecture and algorithms with large real datasets. We currently dispose of a large Twitter dataset (2.1 million accounts, 150 million follower/followee links and around 16 million tweets).
Jin Ruoming, Ruan Ning, Xiang Yang and Lee Victor. A Highway-centric labeling approach for answering distance queries on large sparse graphs. SIGMOD'12.

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Jin Ruoming, Ruan Ning, Xiang Yang and Lee Victor. A Highway-centric labeling approach for answering distance queries on large sparse graphs. SIGMOD'12.