香港浸會大學理學院
HKBU Faculty of Science

DEPARTMENT OF COMPUTER SCIENCE

PhD Degree Oral Presentation

PhD Candidate:	Mr. SUN Zitan
Date	23 April 2024 (Tuesday)
Time:	9:30 am – 11:30 am (35 mins presentation and 15 mins Q & A)
Venue:	1) DLB637, 6/F, David C Lam Building, Shaw Campus 2) ZOOM (Meeting ID: 951 2548 6748) (The password and direct link will only be provided to registrants)
Registration:	https://bit.ly/bucs-reg (Deadline: 12:00 nn, 22 April 2024)

Efficient Truss Decomposition and Maintenance over Dynamic Complex Networks

Abstract

Graph is a widely used model to represent entities and their relationships in many application domains, such as social and communication networks. In many such applications, the network may not always be static and often have edges inserted or removed, which can be modeled as dynamic graphs, or it may not be directly observable, which can be modeled as uncertain graphs. In many graph analytics tasks, dense subgraph identification plays a central role. As a popular notion of dense subgraphs, k-truss requires that each edge has at least k-2 triangles, which has useful applications of modeling social communities and complex network visualization. In practice, in order to enable various truss-based applications to answer queries faster, the edge trussnesses are computed in advance. In this thesis, we study how to compute and maintain trussnesses on large-scale uncertain and dynamic graphs. First, we study truss maintenance on dynamic graphs with the update of edge insertions/deletions. We propose a local update method and an indirect update method to improve efficiency. Second, we study the problem of truss maximization, which aims to enlarge k-truss most by inserting b new edges into a graph G. This work is an application of truss maintenance, as truss maximization involves lots of maintenance when comparing insertion plans. We propose a minimum-cut based approach and a dynamic programming method to find an insertion plan that can make the k-truss as large as possible. Third, we extend the definition of trussness to uncertain graphs and propose efficient algorithms for probabilistic trussness computation and maintenance. Extensive experiment results demonstrate the superiority of our algorithms against the state-of-the-art methods over real large-scale graph datasets.

***** ALL INTERESTED ARE WELCOME *****