日期：	**2019年4月1日（星期一）**
地点：	**复旦大学邯郸校区逸夫楼604**
时间：	**10:00 – 11:00**
主持人：	**复旦大学 周水庚教授, 姜秀艳老师**
演讲人：	**王思博 (香港中文大学工程学院 系统工程与工程管理学系助理教授)**

Efficient Algorithms for Top-k Queries and Heavy Hitter Queries with Personalized PageRank

Abstract: Given a directed graph G, a source node s, and a target node t, the personalized PageRank (PPR) of t with respect to s is the probability that a random walk starting from s terminates at t. The PPR value of t with respect to s indicates the importance of t from the viewpoint of s. This natural helps PPR find extensive applications in social recommendations, e.g., Twitter Who-To-Follow service, Linkedin friend recommendation, and Pinterest related pin recommendation. In particular, given a source node s, it returns the k nodes with the highest PPR values with respect to s and recommends these nodes to s, which is denoted as the top-k PPR query. However, existing solutions for top-k PPR computation is immensely expensive, and at the same time resistant to indexing and materialization. So far, existing solutions either use heuristics, which do not guarantee result quality or rely on the strong computing power of modern data centers, which is costly. Motivated by this, we propose FORA, a simple and effective index-based solution for approximate top-k PPR processing, with rigorous guarantees on result quality. Extensive experiments demonstrate that FORA is orders of magnitude more efficient than its main competitors. Notably, on a billion-edge Twitter dataset, FORA answers approximate top-500 PPR queries within 1 second, using a single commodity server.

Another important query with personalized PageRank is the heavy hitter queries. Given the definition of personalized PageRank, the PageRank score $\pi(t)$ of node t, which denotes the overall importance of node t in the graph, can be defined as the average of the personalized PageRank score of t with respect to each source node $v \in V$. A heavy hitter of node t is a node whose contribution to $\pi(t)$ is above a φ-fraction, where φ is a value between 0 and 1. Finding heavy hitters has important applications in link spam detection, classification of web pages, and friend recommendations. However, existing solutions are still rather inefficient, which motivates us to propose BLOG, an efficient framework for three types of heavy hitter queries: the pairwise approximate heavy hitter (AHH), the reverse AHH, and the multi-source reverse AHH queries. For pairwise AHH queries, our algorithm combines the Monte-Carlo approach and the backward propagation approach to reduce the cost of both methods and incorporates new techniques to deal with high in-degree nodes. For reverse AHH and multi-source reverse AHH queries, our algorithm extends the ideas behind the pairwise AHH algorithm with a new "logarithmic bucketing" technique to improve the query efficiency. Extensive experiments demonstrate that our BLOG is far more efficient than alternative solutions on the three queries.

Bio: Sibo Wang joined The Chinese University of Hong Kong as an Assistant Professor in the Department of SEEM since Dec 2018. He received his B.E. in Software Engineering in 2011 from Fudan University and his Ph.D. in Computer Science in 2016 from Nanyang Technological University. His main research area is database and data mining. He is currently interested in efficient graph query processing for massive graphs and designing algorithms that are practically efficient whilst providing strong theoretical guarantees. Almost all of his research works are published in the most prestigious venues in data management and data mining like SIGMOD, PVLDB, SIGKDD, and ICDE. He has served as the PC members of VLDB 2020, SIGKDD 2019, ASONAM 2019, DASFFA 2019, PAKDD 2018-2019. He is also invited as the reviewers for top journals in database and data mining like VLDBJ, TKDE, and TKDD.

夏令营日期：2019年7月8日至12日(星期一至五）
地点：香港中文大学校园

截止报名日期
2019年4月24日（ 星期三）

- 为有意报名入读本校**2020秋季入学**博士生申请人而设
- 介绍工学院的研究范畴、实验室及研究设施，与本院师生深入交流
- 获取博士生入学面试机会
- 获选香港博士生奖学金的同学将获得每月港币25100元的博士生工资
- 于中大校园内的免费六晚住宿 (7 月7-13日), 以及交通津贴港币1500元

报名网页

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