SHENG YANG

PERSONAL INFORMATION

Email yangsheng6810@gmail.com

Phone 240-475-1675

EXPERIENCE

2015–Present PhD student

Computer Science Department, University of Maryland, College Park

Summer 2018 Data Science Research Intern

Adobe Systems, San Jose

Summer 2017 Research Summer Intern

Bell Laboratories, Murry Hill

2011–2015 Bachelor of Engineering in Computer Science

Tsinghua University, Institute for Interdisciplinary Information Science

COURSES TAKEN

Network Design Foundations; Network Science; Computational Geometry; Bandits, Experts, and Games; Database Management Systems; Foundations of Machine Learning; Quantum Information; Abstract Algebra; Fundamental Ideas in Theoretical Computer Science; Advanced Computer Graphics; Stochastic Mathematical Methods, etc.

JOURNAL PUBLICATION

Samir Khuller, Sheng Yang
Revisiting Connected Dominating Sets: An Optimal Local Algorithm? Algorithmica

Saba Ahmadi, Samir Khuller, Manish Purohit, and Sheng Yang
On Scheduling Coflows. Submitted to Algorithmica

CONFERENCE PUBLICATION

Samir Khuller, Sheng Yang
Revisiting Connected Dominating Sets: An Optimal Local Algorithm? APPROX-RANDOM 2016: 11:1-11:12

Saba Ahmadi, Samir Khuller, Manish Purohit, and Sheng Yang
On Scheduling Coflows. IPCO 2017

Saba Ahmadi, Ioana O. Bercea, Samir Khuller, and Sheng Yang
Counting Small Cliques and Four Node Subgraphs in Bounded Degeneracy Graphs. in preparation

Mosharaf Chowdhury, Manish Purohit, Samir Khuller, Sheng Yang, Jie You
Near Optimal Coflow Scheduling in Networks. SPAA 2019

RESEARCH EXPERIENCE

Near Optimal Coflow Scheduling in Networks: The Coflow scheduling problem is a popular abstraction to study data communication problems within a data center. In this basic framework, each coflow has a set of communication demands and the goal is to schedule many coflows in a manner that minimizes the total weighted completion time. A coflow is said to complete when all its communication needs are met. In this work, we generalize this problem to study coflow scheduling in general graphs (to capture traffic between datacenters) and develop practical and efficient approximation algorithms for it. Our main

result is a randomized 2 approximation algorithm for the single path and free path model, significantly improving prior work. In addition, we demonstrate via extensive experiments that the algorithm performs extremely well in practice.

On Scheduling Coflows: Coflows is a model for MapReduce job scheduling based on switch. Starting from existing 67/3-approx LP-based algorithm (with release time), we improved it to 5, and got rid of the overhead of solving a linear programming. We are currently considering possible improvements and more general models.

Connected Dominating Set with Local Information: We focus on solving Connected Dominating Set problem with limited information on graph, which models visibility issue for a node in social network (e.g. as a user of Facebook, you only know your friends). Apart from closing theoretical gap, we also provide an algorithm that is faster, theoretically and experimentally superior to existing ones. Follow up work is undergoing, trying to generalize this model to other problems. Directed by Professor Samir Khuller

Joint Replenishment Problem with Capacity: the basic idea of classical Joint Replenishment Problem(JRP) is to minimize the cost of shipping items from a supplier to some retailers and the cost of failing to supply them in time. Each shippment induces a fixed cost, and may contain any shippment to retailers. Each shippment to a retailer satisfies all the unsatisfied demand at this retaier by far. Directed by Professor Jian Li.

TEACHING EXPERIENCE

2018 Spring	TA for Advanced Topics in Theory of Computing: Approximation Algorithms
2018 Spring	TA for Algorithms for Data Science
2017 Fall	TA for Complexity Theory
2017 Fall	TA for Design and Analysis of Computer Algorithms
2015-2016	TA for Algorithms
2016 Spring	TA for Elementary Theory of Computation

AWARDS

2018	Outstanding Graduate Student Dean's Fellowships
2016	Summer Dean's Fellowship
2016-2015	Dean's Fellowship
2014	Interdisciplinary Contest In Modeling, Meritorious Winner
2011-2014	Scholarship for Tsinghua Talented Program

SKILLS

Development	C, C++, Python, emacs-lisp, Linux, Bash, javascript, LaTeX, Qt, Java, Matlab
Research	Job Scheduling, Linear Programming, LP rounding, Probability Theory, Graph Theory

May 17, 2019