Mehraneh Liaee

Resume

email: m.liaee2050@gmail.com,
homepage: http://www.ccs.neu.edu/home/mehraneh/ *phone: +1(857)272-9801*

Research Interests

Distributed Computing, Dynamic Network
Embedding Algorithms, Approximation Algorithms, Randomized Algorithms

Education

2014 - present **PhD in Computer Science**, *Northeastern University* *GPA – 3.9/4*,
Advisor: Rajmohan Rajaraman.

2010 - 2012 **MSc in Software Engineering**, *Sharif University of Technology*.

2006 - 2010 **BSc in Computer Engineering**, *Sharif University of Technology*.

Publications

DISC 2016 "**Information Spreading in Dynamic Networks Under Oblivious Adversaries**" J. Augustine, C. Avin, M. Liaee, G. Pandurangan, R. Rajaraman

Research Experiences

"Graph retraction approximation with application in network assignment",
We look at the problem of assigning a distributed computational task to a network of machines. In this scenario, there is a network of machines, and a large distributed computational task. The goal is to map the task to machines in the network such that those tasks which need to communicate more often are assigned to closer machines on the host network. We modeled this problem with graph retraction approximation, looked at some classes of graphs and metrics, such a planar graph, euclidean space, and obtained some approximation algorithms.

"Communication-Aware Embedding in Cloud Environments",
We study the problem of embedding a virtual private network (VPN) into a physical network under hose model. In hose model, a VPN specifies its total bandwidth capacities per VPN node, and the goal is to reserve bandwidth on links of physical network such that any possible demand respecting to capacities can be routed on physical network. We designed approximation algorithms for various objective functions such minimizing max bandwidth, minimizing total cost. Also we saw a connection to minimum spanning tree congestion problem, and developed some approximation algorithm for certain class of graphs such as regular graphs.

"Information Spreading on Dynamic Networks",
We study the problem of information spreading on dynamic networks, where links may be gone and back over time. We try to answer whether there is a distributed algorithm that can efficiently disseminate information to every node of network. We proved two super-linear lower bounds for two classes of distributed protocols and a sub-quadratic upper bound for a central algorithm.

Selected Course Projects

"Implementing a simple derivative of the Unix FFS file system", *Fall 2016*,
We used FUSE toolkit in Linux to implement the file system as a user-space process. Instead of a physical disk, we used a data file accessed through a block device interface, defined in the project. We implemented functionalities such as reading/writing a file, reading a directory, creating/removing a file or directory, getting attribute of a file or directory. To improve the system, we implemented two cache data structures, one for finding files' meta data and one for accessing data blocks in disk. Codes are in C.

"Machine Learning projects", *Fall 2014*,
Implementing KNN, SVM, SMO solver, and testing on Digit data set and Spam data set. Codes are in Java.

Projects codes are available at `https://github.ccs.neu.edu/mehraneh`

Teaching Experiences

Northeastern University

Advanced Algorithms (PhD core course), Fall 2015 & 2016.

Sharif University of Technology

Social Network Analysis (Grad course), Fall 2011.

Discrete Structure, Fall 2011.

Design and Analysis of Algorithms, Spring 2009.

Selected Courses

Machine Learning, Intensive Computer Systems, Advance Topics in Network Algorithms, Randomized and Approximation Algorithms

Honors and Awards

Spring 2016 Granted travel expense for participation in **Women in Theory**.

Summer 2014 & 2015 Granted travel expense for participation in **Women in Computer Science**.

Summer 2013 Ranked **2nd** in IRAN's nationwide Ph.D. entrance exam (major Algorithms and Computations).

2010 Awarded Unconditional Admission for Masters, Sharif University of Technology.

2010 Outstanding Student Award, Sharif University of Technology.

Technical Skills

Programming: C/C++, Java.

Simulation: MATLAB.

Web Development: HTML, CSS, JavaScript, PHP, Symfony Framework.

Platforms: Linux, Windows, Mac OS X.