Mina Ghashami

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Research interests

scalable machine learning   data mining   recommendation systems   deep learning
streaming and online algorithms   matrix approximation   dimensionality reduction   graph
neural networks

Work Experience

- **Applied Scientist, Alexa Video, Amazon.** Sept 2020-present
  working on video recommendation systems and ranking engines in Alexa Video.
  Developing machine learning models to create personalized video recommendations
  for Alexa customers

- **Adjunct Lecturer. Stanford University,** Jan 2022-Mar 2022
  teaching Mining Massive Datasets cs246 course [Winter 2022]

- **Staff Research Scientist, Visa Research**. April 2018-Sept 2020

  Tech lead for CyberSight project; productionized AI-based data driven engine that provides
  merchants with actionable insights to improve dropped sales and reduce operating costs. Core
  components:

  - ❖ "Cause Analysis" that detects high impactful causes of drop in merchants' KPI
  - ❖ "Opportunity Prediction" that recommends opportunities to merchants for improving KPI
  - ❖ "Approval Prediction" an ensemble learner that predicts approval probability of
    transactions

  Other projects include:
  - ❖ "Transaction Predictor"; a graph neural network that predicts next transaction of
    cardholders and merchants
  - ❖ "Group recommender for Restaurants"; a deep neural network trained on individual's
    transactions that recommends restaurants to a group of cardholders.
    - patent application: Computer-implemented method, system and computer program
    product for group recommendation, US Patent 3400WO01

- **PostDoctoral fellow, DIMACS, Rutgers University**. October 2017-March 2018

Advised by Prof. Muthu Muthukrishnan
Worked on multi-armed bandit optimization problems, taught Advanced Algorithms course

- ❏ **Research Assistant, University of Utah**, Salt Lake City, UT. 2012 - 2017

    Advised by Jeff M. Phillips
    Worked on streaming matrix approximation techniques, taught Matrix Sketching Seminar

- ❏ **Visiting Scholar, Johns Hopkins University**, Baltimore, MD. Fall 2016

    Advised by Dr. Raman Arora
    Worked on stochastic matrix approximation, and hashing in streaming settings

- ❏ **Research Intern, Microsoft Research Lab**, Banglore, India. Summer 2014

    Advised by Dr. Ravi Kannan
    Worked on implementing distributed matrix sketching methods in Hadoop

Education

- ❏ **Ph.D. Computer Science, University of Utah**, Salt Lake City, UT. 2012-2017

    Advisor: Dr. Jeff M. Phillips
    Ph.D. Thesis: On FrequentDirections, a Streaming Matrix Sketching Algorithm

- ❏ **M.S. Software Engineering, Sharif University of Technology**, Tehran, Iran 2010-2012

    Masters Thesis: An infrastructure for data analysis extraction in distributed systems

- ❏ **B.S. Software Engineering, Sharif University of Technology**, Tehran, Iran. 2006-2010

    Bachelor Thesis: Implementing an Ajax based content management system using web 2.0

Publications

- ❏ Efficient Frequent Directions Algorithm for Sparse Matrices with Edo Liberty and Jeff M. Phillips. *The 22nd SIGKDD Conference on Knowledge Discovery and Data Mining (KDD 2016)*
- ❏ Frequent Directions: Simple and Deterministic Matrix Sketching, with Edo Liberty, Jeff M. Phillips, David P. Woodruff.*The SIAM Journal of Computing (SICOMP 2016)*
- ❏ Streaming Kernel Principal Component Analysiswith Danny Perry and Jeff M. Phillips. *The 19th International Conference on Artificial Intelligence and Statistics (AISTATS 2016)*

- ❏ Improved Practical Matrix Sketching with Guaranteeswith Amey Desai, Jeff M. Phillips. *The IEEE Transactions on Knowledge and Data Engineering (TKDE 2016)*
- ❏ Improved Practical Matrix Sketching with Guarantees with Amey Desai and Jeff M. Phillips. *The 22nd European Symposium on Algorithms (ESA 2014)*
- ❏ Continuous Matrix Approximation on Distributed Datawith Jeff M. Phillips and Feifei Li. *The 40th International Conference on Very Large Data Bases (VLDB 2014)*
- ❏ Relative Errors for Deterministic Low-Rank Matrix Approximations with Jeff M. Phillips. *The 25th Annual ACM-SIAM Symposium on Discrete Algorithms (SODA 2014)*
- ❏ DLPR, A Distributed Locality Preserving Dimension Reduction Algorithmwith H.Mashayekhi and J.Habibi. *The 5th International Conference on Internet and Distributed Computing Systems (IDCS 2012)*

Conference Services

- PC member of AISTATS, NIPS, ICML
- Reviewer for KDD, DAMI Springer, SISC, STACS

Teaching and Mentorship

- **Co-instructor,** [Mining Massive Data Sets (CS 246)](#), Stanford University.
- **Instructor**, Advanced Algorithms (CS 513), Rutgers University.
- **Guest lecturer**, Randomized and Big Data Algorithms (CS 600.464), Johns Hopkins University. Taught on matrix decompositions and matrix approximations in streaming settings
- **Go-instructor**, Matrix Sketching Seminar (CS 7931/6961), University of Utah. Taught this 1-credit seminar once a week. Lectures were on different methods and ways of approxi- mating matrices, and proving error guarantees for each method
- **Teaching assistant**, Discrete Structures and Algorithms, University of Utah. Held weekly office hours, held problem solving sessions, wrote problem sets for homeworks and graded quizzes, homeworks, midterm and final exams.
- **Teaching assistant**, System Analysis and Design, Object Oriented Design, Sharif University of Technology. Held weekly office hours, designed projects and homeworks, and graded them.

Computer Skills

- ❖ Distributed Data Processing frameworks: Spark, Hadoop, Hive, Pig
- ❖ Machine Learning libraries: Pandas, Scikit-learn, Xgboost, LightGBM
- ❖ Neural Network frameworks: Pytorch, Keras, Tensorflow
- ❖ Programming Languages: Python, Java, C, C++, Matlab, R, SQL

- ❖ Web Development Languages: Flask, PHP, Javascript, Ajax, CSS, Html, APE, JQuery