Sina Sajadmanesh Last update: 28 Apr, 2022

Contact Information

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Research Summary

My research interests lie at the intersection of privacy, deep learning, and graph analysis. More specifically, I use privacy enhancing technologies, such as differential privacy and federated learning, with graph representation learning algorithms, including graph neural networks, to make them more private, secure, and robust for real-world applications.

Education

École Polytechnique Fédérale de Lausanne (EPFL), Lausanne, Switzerland, May 2019 – May 2023
Ph.D. in Electrical Engineering GPA: 5.7 / 6
Thesis: *Learning over Graphs: A Privacy-Preserving Approach*
Adviser: Prof. Daniel Gatica-Perez
Relevant Courses: Artificial Neural Networks (Deep Reinforcement Learning), Deep Learning for Natural Language Processing, Advanced Topics in Machine Learning

Sharif University of Technology, Tehran, Iran, Sep 2014 – Sep 2016
M.Sc. in Information Technology Engineering GPA: 18.1 / 20
Thesis: *Link Prediction in Heterogeneous Multi-Layer Social Networks*
Adviser: Prof. Hamid R. Rabiee
Relevant Courses: Machine Learning, Complex Dynamical Networks, Performance Modeling of Computer Systems, Advanced Network Security, Database Security and Privacy

University of Isfahan, Esfahan, Iran, Sep 2009 – Feb 2014
B.Sc. in Computer Software Engineering GPA: 16.19 / 20 (Last four semesters: 17.4 / 20)
Project: *Design and Implementation of an Android App for Voice Control of Household Devices*
Adviser: Prof. Ahamd R. Naghsh-Nilchi
Relevant Courses: Data Structures, Algorithms, Probability and Statistics, Artificial Intelligence, Information Retrieval, Software Engineering, Databases, Operating Systems, Computer Networks

Research Experience

Research Intern, March 2022 – May 2022
Brave Software, San Francisco, CA, USA (Remote)
- Working on federated reinforcement learning algorithms to build privacy-preserving recommendation systems for Brave's ads and news recommendation.

Research Assistant, May 2019 – present
Social Computing Group, **Idiap Research Institute**, Martigny, Switzerland
- Developing privacy-preserving graph neural network models using differential privacy to reduce the privacy risks of using graph representation learning algorithms in real applications.

Research Assistant, Nov 2014 – May 2019
Data Science and Machine Learning Lab, **Sharif University of Technology**, Tehran, Iran
- Privacy-Preserving Deep Learning: Worked on a hybrid mobile-server learning architecture based on Siamese fine-tuning and split learning to make non-private pre-trained deep learning models privacy-preserving at the inference stage.
- Web Data Science: Analyzed a large-scale collection of recipes published on the web and their content, aiming to understand cuisines and culinary habits around the world.
- Social and Information Networks: Developed time-aware link prediction algorithms over heterogeneous social networks using recurrent neural networks and non-parametric machine learning.

Teaching Experience

Guest Lecturer, Fall 2017
Department of Computer Engineering, **Sharif University of Technology**, Tehran, Iran
Course: Fundamentals of Programming (Python)
Website: http://ce.sharif.edu/courses/96-97/1/ce153-12/

Teaching Assistant
EPFL
- Computational Social Media (Head TA), Spring 2021, Spring 2022

Sharif University of Technology
- Artificial Intelligence (Head TA), Spring 2017
- Advanced Topics in Artificial Intelligence - Statistical Learning Theory, Spring 2016
- Engineering Probability and Statistics, Spring 2016

University of Isfahan
- Artificial Intelligence, Fall 2013

- Advanced Computer Programming 2 - JavaFx and Android, Fall 2012
- Computer Programming - Java, Fall 2011
- Computer Programming - C++, Fall 2010

Industrial Experience

Big-Data Engineer, Sep 2018 – May 2019
Sharif ICT Innovation Center, Tehran, Iran
- Responsible for building a native big-data processing platform using state-of-the-art technologies, such as Spark, Cassandra, JanusGraph, Elasticsearch, etc.

Software Engineering Intern, Summer 2012
Amin Computer Co., Esfahan, Iran
- Responsible for designing and developing an Android application for company's web-based human resource management system.

Publications

[1] **Sina Sajadmanesh**, Ali Shahin Shamsabadi, Aurélien Bellet, and Daniel Gatica-Perez
GAP: Differentially Private Graph Neural Networks with Aggregation Perturbation
Technical Report, ArXiv e-prints, Mar 2022

[2] **Sina Sajadmanesh** and Daniel Gatica-Perez
Locally Private Graph Neural Networks
ACM Conference on Computer and Communications Security (CCS 2021), Nov 2021

[3] Seyed Ali Osia, Ali Shahin Shamsabadi, **Sina Sajadmanesh**, *et al.*
A Hybrid Deep Learning Architecture for Privacy-Preserving Mobile Analytics
IEEE Internet of Things Journal, May 2020

[4] **Sina Sajadmanesh**, Sogol Bazargani, Jiawei Zhang, and Hamid R. Rabiee
Continuous-Time Relationship Prediction in Dynamic Heterogeneous Information Networks
ACM Transactions on Knowledge Discovery from Data, Aug 2019

[5] **Sina Sajadmanesh**, Jiawei Zhang, and Hamid R. Rabiee
NPGLM: A Non-Parametric Method for Temporal Link Prediction
Technical Report, ArXiv e-prints, Jun 2017

[6] **Sina Sajadmanesh**, Sina Jafarzadeh, Seyed Ali Ossia, *et al.*
Kissing Cuisines: Exploring Worldwide Culinary Habits on the Web
International World Wide Web Conference (WWW 2017) Companion, Apr 2017

[7] **Sina Sajadmanesh**, Hamid R. Rabiee and Ali Khodadadi
Predicting Anchor Links between Heterogeneous Social Networks
IEEE/ACM International Conference on Advances in Social Networks Analysis and Mining, Aug 2016

Media Coverage

- **MIT Technology Review**, How Data Mining Reveals the World's Healthiest Cuisines, 3 Nov 2016
- **The Independent**, These are the world's most diverse cuisines, 11 Nov 2016
- **France 24**, Un algorithme compare les cuisines du monde en matière d'ingrédients et d'apports nutritionnels, 15 Nov 2016
- **Sciences et Avenir**, Les cuisines du monde passées au crible des big data, 14 Nov 2016

Talks and Presentations

Locally Private Graph Neural Networks
Graph Neural Networks User Group Meetup, Remote, Jul 2021
AI4Media Workshop on Explainability, Robustness and Privacy in AI, Remote, Jun 2021
Twitter Machine Learning Seminar, Remote, Jan 2021

Privacy-Preserving Deep Learning Over Graphs
Information Processing and Communications Lab, **Imperial College London**, Remote, Dec 2020

Professional Services

- PC Member: ICLR Workshop on PAIR^{2}Struct: Privacy, Accountability, Interpretability, Robustness, Reasoning on Structured Data (2022)
- Reviewer: Artificial Intelligence Journal (2022)
- Reviewer: IEEE Transactions on Big Data (2021)
- Reviewer: ICLR Workshop on Distributed and Private Machine Learning (2021)
- Reviewer: ACM Transactions on Intelligent Systems and Technology (2020)
- Reviewer: Social Network Analysis and Mining Journal (2020)
- Reviewer: World Wide Web Journal (2018)

Honors and Awards

- **Finalist**, in CSAW Applied Research Competition for the best paper award in computer security, 2021
- **PhD admission**, Computer Science, University of Illinois at Urbana-Champaign, 2018 (declined)
- **PhD admission** Computer Science, Hong-Kong University of Science and Technology, 2017 (declined)
- **Ranked 3rd** in cumulative GPA among B.Sc. Computer Software Engineering students admitted for Fall 2009, University of Isfahan , 2014
- **Ranked 6th** in Iranian nationwide university entrance exam for graduate studies, field of Artificial Intelligence, among more than 100000 students, 2014
- **Ranked 15th** in Iranian nationwide university entrance exam for graduate studies, field of Computer Networks and Security, among more than 30000 students, 2014
- **Ranked 28th** in 18th National Computer Olympiad for University Students at Tarbiat Modares University , Tehran, Iran, 2013
- **Ranked 16th** in ACM-ICPC regional contest, Asia region, Tehran site, among more than 70 teams at University of Tehran , Tehran, Iran, 2011
- **Ranked 2nd** in nationwide collegiate programming contest among more than 70 teams at University of Kashan , Kashan, Iran, 2010
- **Ranked among top 0.02%** in Iran's nationwide university entrance exam for undergraduate studies., 2009

Memberships

ACM Professional Member, 2020 – 2021
ACM Student Member, 2011 – 2014
ACM-ICPC Student Chapter, University of Isfahan, Esfahan, Iran, 2010 – 2012

Technical Skills

Programming:
Python, Java, C, C++, MATLAB, PHP, Javascript

Information Retrieval & Analytics:
Elasticsearch, JanusGraph, Cassandra

Data Science and Machine Learning:
PyTorch, PyTorch-Geometric, PyTorch-Lightning, Deep Graph Library, Scikit-Learn, Pandas

References

Prof. Daniel Gatica-Perez, Idiap Research Institute, EPFL
Website: https://idiap.ch/~gatica Email: daniel.gatica-perez@epfl.ch

Prof. Hamid R. Rabiee, Department of Computer Engineering, Sharif University of Technology
Website: http://sharif.ir/~rabiee Email: rabiee@sharif.edu

Prof. Hamed Haddadi, Dyson School of Design Engineering, Imperial College London
Website: https://haddadi.github.io/ Email: h.haddadi@imperial.ac.uk

Prof. Emiliano De Cristofaro, Department of Computer Science, University College London
Website: https://emilianodc.com/ Email: e.decristofaro@ucl.ac.uk