Payam Siyari

Software Engineer, Goolge LLC

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TECHNICAL TOPICS OF INTEREST

- Graph Mining, Network Science, Social and Information Networks
- Natural Language Processing, Grammar Induction
- Maps and Geo-spatial Data Science
- Ads and Recommender Systems
- Algorithms, Combinatorial Optimization, Algorithmic Game Theory
- Database Systems and Information Retrieval

EDUCATION

- **Georgia Institute of Technology (GATech)**,
  School of Computer Science, College of Computing, Atlanta, GA. 2014 - 2018.
  Ph.D. in Computer Science - Minor in *Statistics*.
  Advisors: Dr. Constantine Dovrolis, Dr. Bistra Dilkina
  PhD Thesis: *Optimization-Driven Emergence of Deep Hierarchies with Applications in Data Mining and Evolution*
- **Georgia Institute of Technology (GATech)**,
  School of Computer Science, College of Computing, Atlanta, GA. 2014 - 2016.
  M.Sc in Computer Science - Specialization in *Machine Learning*. **GPA: 4.00/4.00**.
  Coursework: *Machine Learning, Deep Learning for Perception, Natural Language Processing, Data and Visual Analytics, Network Science, Time Series Analysis, High Performance Computing, Computability and Algorithms, Machine Learning for Trading, Regression Analysis, Statistical Methods*
- **Sharif University of Technology (SUT)**,
  Department of Computer Engineering, Tehran, Iran. 2011 - 2013.
  M.Sc. in Computer Engineering - Software. **GPA: 19.24/20** (1st Rank).
  M.Sc. Thesis: *Network Topology Inference from Incomplete Data* (Score: **20/20**).
  Coursework: *Statistical Pattern Recognition, Data Mining, Algorithmic Game Theory, Performance Evaluation of Computer Systems, Advanced Operating Systems, Convex Optimization (Audited)*
- **Shahid Beheshti University (SBU)**,
  Department of Mathematical Sciences, Tehran, Iran. 2007 - 2011.
  B.Sc. in Computer Science. **GPA: 18.46/20** (1st Rank).
  B.Sc. Thesis: *Design and Implementation of a Native XML Database Management System* (Score: **20/20**).

PROFESSIONAL EXPERIENCE

- **Software Engineer III**, Google LLC - Mountain View, CA.
  Mar. 2022 - Present.
  - **Payments risk decision quality:**
    - Redesign and implementation of loss analytics across payments platform:
      - Employed a weak-supervision learning paradigm which involved writing a large-scale pipelines to ensemble different loss labelers, and large-scale GBDT model training.

        - I lead a small team to expand the implementation to leverage tabular foundation models for larger label coverage.
    - Main decision quality engineer for merchant collusion fraud detection:
        - We implemented a system on using bipartite clustering coefficients for early detection of signs of collusion fraud.
    - Main decision quality engineer for hijacked account-fraud detection:
        - Included incorporating new challenge flows in the decision making and user journeys, fraud spike mitigation, and new feature ramp ups via offline and online experimentation.
    - Quality engineer for external partnerships:
        - I was in charge of analytical tools for assessing contribution of external signals for our platforms.

- **Senior Data Scientist**, Aurora Innovation, Inc. - San Francisco, CA.
  Jan. 2021 - Mar. 2022
  - Aurora Innovation, Inc. acquired Uber ATG.
  - **Analytics of autonomous trucking operations and triage**:
    - Data-driven study pipeline for construction scenario mining.
  - **Autonomous trucking product strategy modeling & optimization**:
    - Geo-spatial analysis for economics of resource placement and assignment.
    - Weather data warehouse design and management for engineering & business planning.

- **Senior Data Scientist**, Uber Advanced Technologies Group - San Francisco, CA.
  Jan. 2020 - Dec 2020.
  Data Scientist II, Uber Advanced Technologies Group - San Francisco, CA.
  Oct. 2018 - Dec. 2019.
  - *Full-Stack Data Scientist*:
    - **Worked on data-driven outlook for expansion of self-driving rideshare service:**
        - Statistical analysis for strategic decisions, e.g. minimum test miles before deployment.
        - Deep learning for geo-spatial representations of satellite images & road networks.
    - **Developed tooling for analysis of occurrence of offline tests in on-road driving logs:**
        - Algorithm development for geo-spatial modeling & indexing using Uber UMM & H3.
        - Data Engineering for large-scale pipeline development (Hive, Spark).
  - *@UberEngineering Blog Showcase*:
    - Power On: Accelerating Uber's Self-Driving Vehicle Development with Data
    - Searchable Ground Truth: Querying Uncommon Scenarios in Self-Driving Car Development

- **Software Engineering Intern**, Uber Advanced Technologies Group - Pittsburgh, PA.
  Aug. 2017 - Dec. 2017.
  - Self-Driving Technology Engineer (Road Analytics)
  - Supervised by Andrew Duberstein and Dr. Collin Otis.

  - Scalable automated scenario identification in autonomous driving logs.

- **Research Intern**, Machine Learning for Document Access and Translation (ML-DAT) Team, Xerox Research Center Europe (XRCE - Now: NAVER LABS Europe) - Grenoble, France.
  Aug. 2015 - Dec. 2015.
  - Supervised by Dr. Matthias Gallé.
  - Research on MDL-Based grammatical inference from sequential data.
  - Applications in compression & unsupervised parsing of natural language.
- **Research Assistant**, College of Computing, Georgia Institute of Technology - Atlanta, GA.
  Aug. 2014 - Dec.2018.
  - Supervised by Dr. Constantine Dovrolis and Dr. Bistra Dilkina.
  - Research on analysis and modeling of optimization-driven hierarchical structures.
  - Applications in pattern Mining, feature extraction, compression and evolution.
- **Research Assistant**, Dept. of Computer Engineering, Sharif University of Technology - Tehran, Iran.
  Dec. 2011 - Dec. 2013.
  - Supervised by Dr. Hamid R. Rabiee.
  - Research on network inference via matrix factorization & compressed sensing.
  - Research on epidemic models over multilayer networks.
- **iOS Developer**, Pichak co. - Tehran, Iran.
  Apr. 2011 - Sep. 2011.
  - VPN in Touch: A VPN account management app (client side).

ACADEMIC PUBLICATIONS

- **Journal Papers:**
  - **P. Siyari**, B. Dilkina, C. Dovrolis, **"Emergence and Evolution of Hierarchical Structure in Complex Systems"**, Dynamics On and Of Complex Networks III (DOOCN 2017) - Machine Learning and Statistical Physics Approaches, pp. 23-62, Springer Proceedings in Complexity, 2018.
  - M. Salehi, R. Sharma, M. Marzolla, D. Montesi, **P. Siyari**, and M. Magnani, **"Spreading Processes on Multilayer Networks"**, IEEE Transactions on Network Science and Engineering, Vol. 2, No. 2, pp. 65-83, 2015.
  - M. Salehi, **P. Siyari**, M. Magnani, D. Montesi, **"Multidimensional Epidemic Thresholds in Diffusion Processes over Interdependent Networks"**, Chaos, Solitons & Fractals, Vol. 72, pp. 59-67, 2015.
  - A. Fattaholmanan, H. R. Rabiee, **P. Siyari**, A. Khodadadi, and A. Soltani-Farani, **"A Peer to Peer Compressive Sensing Framework for Network Monitoring"**, IEEE Communications Letters, Vol. 19, No. 1, pp. 38-41, 2015.
  - **P. Siyari**, H. R. Rabiee, M. Salehi, and M. Eslami, **"Network Reconstruction under Compressive Sensing"**, ASE Human Journal, Vol. 1, No. 3, pp. 130-143, 2012 *(Only the top 3% papers of SocialInformatics'12 were included).*
- **Conference & Workshop Papers:**
  - **P. Siyari**, B. Dilkina, C. Dovrolis, **"Emergence and Features of Deep Hierarchies"**, SIAM Workshop on Network Science (SIAM NS'22), Sep. 2022.

- **P. Siyari**, B. Dilkina, C. Dovrolis, **"Evolution of Hierarchical Structure and Reuse in iGEM Synthetic DNA Sequences"**, International Conference on Computational Science (ICCS'19), pp. pp 468-482, Lecture Notes in Computer Science, Vol. 11536, 2019.
- **P. Siyari**, M. Gallé, **"The Generalized Smallest Grammar Problem"**, Proceedings of International Conference on Grammatical Inference (ICGI'16), PMLR 57, pp. 79-92, 2017.
- **P. Siyari**, B. Dilkina, C. Dovrolis, **"Lexis: An Optimization Framework for Discovering the Hierarchical Structure of Sequential Data"**, Proceedings of ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD'16), pp. 1185-1194, Aug. 2016 (*Oral Presentation - Acceptance Rate: 18.11%*).
- H. Mahyar, H. R. Rabiee, Z. S. Hashemifar, and **P. Siyari**, **"UCS-WN: An Unbiased Compressive Sensing Framework for Weighted Networks"**, Proceedings of Conference on Information Sciences and Systems (CISS'13), pp. 1-6, Mar. 2013.
- **P. Siyari**, H. R. Rabiee, M. Salehi, and M. Eslami, **"Network Reconstruction under Compressive Sensing"**, Proceedings of ASE/IEEE International Conference on Social Informatics, pp. 19-25, IEEE Comp. Soc., Dec. 2012.
- P. Siyari, H. Aghaeinia, and **P. Siyari**, **"Power Allocation in Relay Networks: A Stackelberg Game Approach"**, Proceedings of Majlesi Symposium on Telecommunication Devices, Feb. 2014.

- **Technical Reports:**
  - **P. Siyari**, and H. R. Rabiee, **"Fast Non-negative Matrix Factorization under KL-Divergence: A Case for Link Prediction"**, Sharif University of Technology, 2013.
- **Theses:**
  - **P. Siyari**, **"Optimization-Driven Emergence of Deep Hierarchies with Applications in Data Mining and Evolution"**, Computer Science PhD Thesis, School of Computer Science, College of Computing, Georgia Institute of Technology, 2018.
  - **P. Siyari**, **"Network Topology Inference from Incomplete Data"**, Computer Engineering (Software) M.Sc. Thesis, Department of Computer Engineering, Sharif University of Technology, 2013 (in Persian).
  - **P. Siyari**, **"Design and Implementation of a Native XML Database Management System"**, Computer Science B.Sc. Thesis, Faculty of Mathematical Sciences, Shahid Beheshti University, 2011 (in Persian).

ACADEMIC HONORS & AWARDS

- **College of Computing Travel Grant** from Graduate Student Council and Graduate Programs Office, Georgia Institute of Technology, 2018.
- **1st Rank** GPA among graduates of *Computer Engineering - Software* M.Sc. students (2011 beginners), Sharif University of Technology, 2013, Tehran, Iran.
  Remark: Because of this high rank, I was permitted to continue my studies as a PhD student without having to attend any examinations.
- **2nd Rank** according to GPA among *all* graduates of *Computer Engineering* M.Sc. students (2011 beginners), Sharif University of Technology, 2013, Tehran, Iran.
- **6th Rank** among 1,006 test takers in the Nationwide PhD Entrance Examination (Konkoor) in *Computer Engineering - Artificial Intelligence*, 2013, Tehran, Iran.
- **1st Rank Overall** among 26,195 test takers in the Nationwide M.Sc. Entrance Examination (Konkoor) in *Computer Engineering*, 2011, Tehran, Iran.
  - **1st Rank** in *"Software Engineering"*, **1st Rank** in *"Algorithms & Computations"*, **5th Rank** in *"Artificial Intelligence"*, **5th Rank** in *"Computer Architecture"*.

- **2nd Rank** among 2,132 test takers in the Nationwide M.Sc. Entrance Examination (Konkoor) in *Computer Science*, 2011, Tehran, Iran.
- **1st Rank** GPA among graduates of *Computer Science* B.Sc. students (2007 beginners), Shahid Beheshti University, 2011, Tehran, Iran.
  Remark: Because of this high rank, I was permitted to continue my studies as a M.Sc. student without having to attend any examinations.
- Awarded **Exceptional Talent Admission** for **M.Sc.** Program, Department of Computer Engineering, Sharif University of Technology, 2011, Tehran, Iran.
- Offered **Exceptional Talent Admission** for **M.Sc.** Program, Department of Mathematical Sciences, Shahid Beheshti University, 2011, Tehran, Iran.
- **34th Rank** among 1,870 test takers in the Nationwide M.Sc. Entrance Examination (Konkoor) in *Computer Science* as *a Junior Student*, 2010, Tehran, Iran.

ACADEMIC TEACHING EXPERIENCE

- **Teaching Assistant**, Georgia Institute of Technology:
  - **Computer Networks I (CS 3251 - Undergrad)**, Spring 2018.
  - **Design & Analysis of Algorithms (CS 3510 - Undergrad)**, Spring 2016.
- **Teaching Assistant**, Sharif University of Technology:
  - **Machine Learning (Grad), Social and Information Network Analysis (Grad)**, Fall 2013.
  - **Statistical Pattern Recognition (Grad), Program Development from Formal Specification (Grad)**, Spring 2013.
  - **Formal Specification and Verification (Grad)**, Fall 2012, 2013.
- **Teaching Assistant**, Shahid Beheshti University:
  - **Numerical Analysis, Probability & Statistics**, Spring 2011.
  - **Data Structures, Compilers, Theory of Computation**, Fall 2010.
  - **Advanced Programming, Numerical Linear Algebra**, Fall 2009.

ACADEMIC SERVICES

- **External Reviewer for:**

  – IEEE Transactions on Information Forensics & Security – PLOS ONE – ALENEX'17 – NetSciCom'14 – SocialCom'13 – ICEE'13,'15

SKILLS

Programming:	Python, Java, C, C++, Swift, Objective-C, C#
Machine Learning:	PyTorch, Tensorflow, Keras, NLTK, NeworkX, SNAP, RapidMiner
Big Data:	Hive, Spark, Amazon AWS, Pig
Database Systems:	SQLite, PostgreSQL, MySQL, Microsoft SQL Server
Web Technologies:	React JS, Django, DASH, Bokeh, D3, PHP
Scientific Computing:	MATLAB, OpenMPI, R, Octave, Mathematica

REFERENCES Available upon request.