Alaleh Ahmadian

Curriculum Vitae

School of Electrical Engineering and Computer Science
Washington State University
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Research Summary

My general research interests are in Artificial Intelligence (AI), Machine Learning (ML), and Sequential Decision-making under Uncertainty with applications to real-world problems in engineering and scientific domains. My current research focuses on developing fast and effective Bayesian Optimization (BO) methods and applying them to real-world problems to accelerate hardware design and 3D printing of biomedical structures.

Education

Washington State University, Pullman, WA — Fall 2019 –
Doctor of Philosophy in Computer Science
Advisor: Prof. Jana Doppa
Research Topic: *Use-Inspired Bayesian Optimization for Science and Engineering Applications*

Sharif University of Technology, Tehran, Iran — 2014 – 2019
Bachelor of Science in Computer Science
Research Topic: *Design and development of scalable algorithms for graph-matching in large ride-sharing networks*

Professional Experience

Research Assistant, Washington State University, EECS — Aug 2019 – Present

Teaching Assistant, Washington State University, EECS — Aug 2019 – Present
CptS 415: Big Data (Fall 2023)
CptS 570: Machine Learning (Fall 2022)
CptS 415: Big Data (Fall 2021)
CptS 223: Advanced Data Structures (Fall 2020)
CptS 350: Design and Analysis of Algorithms (Spring 2020)

Machine Learning Engineering Intern, Rahnema Co, Tehran, Iran — Dec 2018 – Mar 2019
Description: Developing a recommendation system for online shopping websites based on deep learning methods.

Teaching Assistant, Sharif University of Technology, CS-Math — Fall 2015 – Fall 2018
CS22014: Introduction To Programming(Java) (Fall 2018)
CS22891: Design and Analysis of Algorithms (Spring 2017)
CS22822: Data Structure Design (Fall 2016)
CE22013: Introduction To Programming(C/C++) (Fall 2015)

Front-End Web Development Intern, Chi Co, Tehran, Iran — Sept 2016 – Dec 2016
Front-End design and development using HTML, CSS, Javascript, and Bootstrap

Algorithm Design and Programming Instructor, Farzanegan1 Highschool, Mashhad, Iran
June 2014 – Sept 2014
Teaching algorithm design and C++ programming for National Olympiad in Informatics (INOI).

Publications

- A. Ahmadianshalchi, S. Belakaria, J. Doppa **Preference-Aware Constrained Multi-Objective Bayesian Optimization**. *7th Joint International Conference on Data Science & Management of Data (ACM CODS-COMAD)*, 2024.

- A. Ahmadianshalchi, S. Belakaria, and J. Doppa **Pareto front-Diverse Batch Multi-Objective Bayesian Optimization**. *37th Conference on Neural Information Processing Systems (NeurIPS)*, 2023. Under review.
- A. Ahmadianshalchi, S. Belakaria, Z. Zhou, J. Doppa, and D. Heo. **Design Automation of Analog Circuits via Information-Theoretic Optimization**. *IEEE Design and Test of Computers*, 2022. Under review.
- Z. Zhou*, A. Ahmadianshalchi*, S. Belakaria, J. Doppa, and D. Heo. **Multi-Output Switched-Capacitor Converter Design Optimization via Machine Learning**. *IEEE Design and Test of Computers*, 2022. Under review.
- A. Ahmadianshalchi, S. Belakaria, J. Doppa **Preference-Aware Constrained Multi-Objective Bayesian Optimization for Analog Circuit Design: An Information-Theoretic Approach**. *Workshop on ML for Systems at Conference on Neural Information Processing Systems (NeurIPS)*, 2022.
- A. Ahmadianshalchi, A. Deshwal, C. Simon, and J. Doppa. **Bayesian Optimization for Design of Metal-organic Frameworks.** *(In preparation)*
- A. Ahmadianshalchi, K. Qiu, and J. Doppa. **Machine Learning Assisted 3D Printing of Organ Models** *(In preparation)*

Skills

- Python, R, SQL, MATLAB, C, C++, Java
- Data Analysis, Data Visualization, Mathematical Modeling, Statistical Modeling, Algorithm Analysis, Data structures, Discrete Mathematics, Graph Theory, Statistics, and Problem-Solving theoretically and practically
- Web development (Django, Python, CSS, HTML, JS, VueJS),
- LaTeX, Linux, Bash, git

Academic Projects

Machine Learning to Optimize 3D Printing, Dec 2021 – Present
Description: Designing a multi-objective Bayesian Optimization method to optimize 3D printing of body parts

Bayesian Optimization to Accelerate Hardware Design, Aug 2021 – Present
Description: Designing a robust Bayesian Optimization method to optimize a high conversion ratio converter's efficiency as well as settling time. Paper to be submitted to TVLSI journal.

Bayesian Optimization for Metal-Organic Frameworks, July 2021 – Present
Description: Design a multi-objective Bayesian optimization algorithm to select optimal metal-organic framework (MOF) structures from a library of materials for hydrogen-powered vehicles. Paper to be submitted to Chemistry journal.

Ride-Sharing graph matching, Oct 2018 – May 2019
Description: Developing a scalable algorithm to find the most efficient matching for a ride-sharing system in a mega city network graph.

News Sentiment Analysis, Jan 2018 – July 2018
Description: Using sentiment analysis to Find the relationship between fake news and its prominent attributes in order to classify news sources that are mostly fake and predict the type of news(fake, true, misleading,...).

Awards and Honors

Outstanding Graduate Teaching Assistant Award from Voiland College of Engineering
Washington State University 2022

Outstanding Graduate Teaching Assistant Award from EECS Department
Washington State University 2022

Selected amongst the top 40 people from 1800 candidates through three rounds of exams for Rahnema College ML internship 2018

Ranked in the first 0.5% (791 out of 191,551 participants) in the national university entrance exam (Math and Physics major) 2014

Ranked in the first 0.1% (122 out of 99,104 participants) in the national university entrance exam (English Literature major) 2014

Certifications

- TOEFL IBT : 110/120 (Reading: 26/30, Listening: 30/30, Speaking: 27/30, Writing: 27/30)
- General GRE: Quantitative Reasoning: 170/170, Verbal Reasoning: 149/170, Analytical Writing: 4.5/6

Relevant Coursework

Toward Ph.D. Degree at Washington State University

- Machine Learning (CPTS 570), Neural Network Design and Applications (CPTS 534), Data Science (CPTS 575), Computational Genomics (CPTS 571), Advanced Algorithms (CPTS 515), Software Quality (CPTS 583), Big Data (CPTS 415)

Miscellaneous

Program Committee Member - Conference Reviewer

- Conference on Neural Information Processing Systems (NeurIPS) WiML workshop, 2023
- Association for the Advancement of Artificial Intelligence (AAAI) Conference - 2023, 2024
- AAAI Workshop on AI to Accelerate Science and Engineering-2022

Technical/Professional Events

- Selected to Participate in Meetings for Professional Growth
  - CRA-WP Graduate Cohort for Women - 2020, 2021, 2022
- Presentations/Talks
  - SRC TechCon 2022 - Presenting our work on "Preference-Aware Bayesian Optimization to Accelerate Hardware Design".
- Volunteer Work
  - Women in Machine Learning (WiML) Workshop, NeurIPS 2022
  - International Conference on Machine Learning (ICML), 2022
  - Women in Machine Learning (WiML) Workshop, NeurIPS 2021

Languages

- Persian (Native), English (Professional), Arabic (Limited Working Proficiency), French (Limited Working Proficiency)

References

- Prof. Jana Doppa
  George and Joan Berry Distinguished Associate Professor
  School of Electrical Engineering and Computer Science
  Washington State University
  Email: jana.doppa@wsu.edu
- Prof. Partha Pande
  Boeing Centennial Chair Professor
  School of Electrical Engineering and Computer Science
  Washington State University
  Email: pande@wsu.edu