

Sima Jamali

Curriculum Vitae

San Diego, USA

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Objective

Highly skilled Researcher/Developer with 8 years of experience specializing in developing and implementing algorithms and heuristics to solve complex problems.

Work Experience

2022–2024 **University of California San Diego, USA.**

Postdoctoral Researcher - Halicioğlu Data Science Institute

- Awarded a two-year Postdoctoral Fellowship to conduct research in machine learning and data science.
- Researched and Implemented recommendation system algorithms for large-scale datasets, with a focus on enhancing model accuracy and fairness.
- Mentored students in research on SAT solvers, helping them design and execute research projects, and contributed to grant writing efforts.

Education

2015–2021 **Simon Fraser University, Vancouver, Canada.**

Ph.D. Computer Science

- Dissertation Topic: “CDCL SAT Solver Heuristics: Clause Management, Instance Structure, and Decisions”
- Cumulative GPA: 4.00/4.33

2012–2015 **Sharif University of Technology, Tehran, Iran.**

M.Sc. Computer Science - Artificial Intelligence

- Dissertation Topic: “Improving the Efficiency of SAT-Based Planning by Enhancing the Representations”
- Cumulative GPA: 17/20

2008–2012 **Azad University of Mashhad, Mashhad, Iran.**

B.Sc. Information Technology Engineering

- Dissertation Topic: “VoIP in Cisco and Implementing a few Scenarios”
- Cumulative GPA: 18/20

Technical Skills

Languages C++, Python, R.

Tools & Databases Matlab, Git, SQLite., Jupyter Notebook, Gephi

Libraries NumPy, Pandas, TensorFlow, Matplotlib

Projects

Location-Aware Restaurant Recommendations on Google Maps Data.

Enhanced recommendations by leveraging matrix factorization models to prioritize location relevance. (Python, TensorFlow, Jupyter Notebooks)

- o Analyzed geographical data to assess the impact of location on the recommended restaurants, uncovering trends and patterns in user preferences.
- o Developed and implemented a framework aimed at increasing locality in recommendations, improving the relevance of suggestions based on user proximity.
- o Investigated popularity bias in recommender systems to enhance fairness.

Leveraging SAT Instance Structure to Enhance CDCL Solver Performance.

Developed and implemented a novel learnt clause deletion scheme for CDCL SAT solvers based on the properties of industrial SAT instances. (C++, Python, Gephi)

- o Developed a novel clause quality measure leveraging the structural properties of SAT formulas.
- o Utilized tools and libraries like Gephi and Graphviz to visualize and analyze graphs from SAT formulas and created a tool to extract advanced features.
- o Integrated innovative heuristics into advanced SAT solvers, enhancing performance.

Innovative Clause Database Management Strategy for SAT Solvers.

Conducted in-depth analysis of learnt clauses in CDCL solvers and Developed advanced techniques in clause database management, leading to enhanced solver efficiency. (C++)

- o Implemented the 2nd place SAT solver in SAT competitions 2021
- o Analyzed learnt clauses in CDCL SAT solvers using various criteria to assess their significance in conflict analysis.
- o Developed and implemented a novel clause management strategy for solvers.

A Crowdsourcing Interface for Object Localization.

Leveraged crowd power for object localization tasks. (PYBOSSA, Python)

- o Implemented a platform to use crowdsourcing techniques in object detection and created a new object database using the results for future tasks.

Publications

- 2021 Jamali, S. and Mitchell, D. **"An Experimental Study of Permanently Stored Learned Clauses"** Pragmatics of SAT.
- 2019 Jamali, S. and Mitchell, D. **"Simplifying CDCL Clause Database Reduction"** International Conference on Theory and Applications of Satisfiability Testing.
- 2018 Jamali, S. and Mitchell, D. **"Centrality-Based Improvements to CDCL Heuristics"** International Conference on Theory and Applications of Satisfiability Testing.
- 2017 Jamali, S. and Mitchell, D. **"Improving SAT Solver Performance with Structure-Based Preferential Bumping."** Global Conference on Artificial Intelligence.
- 2016 Jamali, S., McBride, R. and Mitchell. **"Experiments with CNF Structure and Hardness."** Graph Structure and Satisfiability Testing Workshop.