

## Sina Baharlouei

---

|                     |   |  |
|---------------------|---|--|
| INTRODUCTION        | Research Scientist with <b>+6 years</b> of experience in <b>Large-scale Machine Learning</b> in academia, and <b>2+ years of Machine Learning Researcher and Software Engineering</b> experience in industry. Solid background in <b>Optimization, Statistics</b> , and large-scale <b>data processing</b> , with hands-on skills in various major Machine Learning libraries and Big Data frameworks.  |  |
| CONTACT INFORMATION | Dept. Industrial and Systems Engineering<br>University of Southern California<br>Office: OHE 340, 3650 McClintock Ave<br>Los Angeles, California  | Site: <a href="https://sinabaharlouei.github.io/website">https://sinabaharlouei.github.io/website</a><br>email: <a href="mailto:baharlou@usc.edu">baharlou@usc.edu</a><br>Cell +1-424-537-9656 |
| RESEARCH INTERESTS  | <ul style="list-style-type: none"><li>◇ Scalable Machine Learning and Stochastic Algorithms</li><li>◇ Trustworthy AI: Fair and Robust Machine Learning</li><li>◇ Distributionally Robust Optimization, MinMax Game Theory, Learning Under Uncertainty</li></ul>   |  |
| SKILLS              | <ul style="list-style-type: none"><li>◇ PROGRAMMING: <b>Python</b>, R, C/C++, Java, PHP</li><li>◇ MACHINE LEARNING: <b>PyTorch</b>, Tensorflow, <b>Numpy</b>, Scikit Learn</li><li>◇ BIG DATA: SQL, Apache Spark, MongoDB, OpenMPI, Redis</li><li>◇ OPTIMIZATION: <b>CVX</b>, Gurobi, <b>Scipy</b></li></ul>  |  |
| EDUCATION           | <b>University of Southern California (USC)</b> , Los Angeles, California <ul style="list-style-type: none"><li>◇ <b>Ph.D in Industrial and Systems Engineering</b> (Fall 2017 - Summer 2024)<ul style="list-style-type: none"><li>• <b>Advisor:</b> Prof. Meisam Razaviyayn</li><li>• <b>Thesis:</b> Scalable Optimization for Trustworthy AI: Robust and Fair Machine Learning</li></ul></li><li>◇ <b>Master of Science in Statistics</b> (August 2020 - May 2023)<ul style="list-style-type: none"><li>• GPA: 3.97/4</li></ul></li></ul> <b>Amirkabir University of Technology (Tehran Polytechnic)</b> , Tehran, Iran <ul style="list-style-type: none"><li>◇ B.Sc. Software Engineering (September 2012 - September 2016)</li></ul> |  |
| WORK EXPERIENCE     | <ul style="list-style-type: none"><li>◇ <b>Machine Learning Research Intern, Bosch Center of AI</b>, Summer 2021, Pittsburgh, PA.<ul style="list-style-type: none"><li>• <b>Robust Deep Learning:</b> Design and implementation of certifiably robust neural networks against adversarial and out-of-distribution incidents for <b>self-driving cars</b></li><li>• <b>Result:</b> Published as a conference paper in AISTATS 2023</li></ul></li><li>◇ <b>Senior Backend Developer, Turned On Digital (TOD)</b>, 2014-2016: API design and server-side development and maintenance of <b>Sibche</b></li></ul>  |  |
| HONORS AND AWARDS   | <ul style="list-style-type: none"><li>◇ Viterbi Graduate Student Fellowship</li><li>◇ Top 3 papers in ICML 2023 Workshop on Duality Principle for Modern ML.</li><li>◇ Bronze Medal in <b>International Mathematics Competition (IMC)</b>, Bali, Indonesia, 2011</li></ul>  |  |
| PUBLICATIONS        | <ul style="list-style-type: none"><li>◇ <b>Sina Baharlouei</b>, Maher Nouiehed, Ahmad Beirami, and Meisam Razaviyayn. "Rényi Fair Inference", <i>International Conference on Learning Representations (ICLR)</i>, 2020.</li><li>◇ Andrew Lowy*, <b>Sina Baharlouei*</b>, Rakesh Pavan, Meisam Razaviyayn, and Ahmad Beirami. "A Stochastic Framework for Fair Risk Minimization", <i>Transaction on Machine Learning Research (TMLR)</i>, 2022. (<a href="#">Github Link</a>)</li></ul>   |  |

- ◇ **Sina Baharlouei**, Fatemeh Sheikholeslami, Meisam Razaviyayn, and Zico Kolter: "Improving Adversarial Robustness via Joint Classification and Multiple Explicit Detection classes." AISTATS 2023.
- ◇ **Sina Baharlouei**, Kelechi Ogudu, Sze-chuan Suen, and Meisam Razaviyayn. "RIFLE: Imputation and Robust Inference from Low Order Marginals". *Transaction on Machine Learning Research* (TMLR), 2023. ([Github Link](#))
- ◇ **Sina Baharlouei**, Meisam Razaviyayn, Elizabeth Tseng, and David Tse. "I-CONVEX: Fast and Accurate de Novo Transcriptome Recovery from Long Reads". ECML-PKDD (2022). ([Github Link](#)).
- ◇ Peng Dai, **Sina Baharlouei**, Meisam Razaviyayn and Sze-chuan Suen. "Feature Selection in the Presence of Monotone Batch Effects". *Accepted in ICML Workshop on Spurious Correlations, Invariance, and Stability, 2023* ([Github Link](#))
- ◇ Maziar Sanjabi, **Sina Baharlouei**, Meisam Razaviyayn and Jason D. Lee. "When Does Non-Orthogonal Tensor Decomposition Have No Spurious Local Minima?". *Submitted to Siam Journal on Mathematics of Data Science*.
- ◇ **Sina Baharlouei** and Meisam Razaviyayn. "Dr. FERMI: A Stochastic Distributionally Robust Fair Empirical Risk Minimization Framework", Submitted to AISTATS 2024 ([Github Link](#))
- ◇ **Sina Baharlouei**, Shivam Patel and Meisam Razaviyayn. "f-FERM: A Scalable Framework for Robust Fair Empirical Risk Minimization", Submitted to ICLR 2024

#### TEACHING EXPERIENCE

**University of Southern California**, Los Angeles, California

- ◇ [Large Scale Optimization and Machine Learning](#) (PhD Level),
- ◇ [Probability Concepts in Engineering](#)(Undergraduate Level),
- ◇ [Engineering Statistics](#) (Undergraduate Level)

#### RELEVANT EDUCATION AND COURSEWORK

- ◇ **Large Scale Optimization for Machine Learning**, Fall 2017: Applications of optimization algorithms in large-scale machine learning problems
- ◇ **Network Flow and Combinatorial Optimization**, Spring 2018: Studying classical graph problems such as Max-flow, Min-cut, and TSP from an optimization point of view
- ◇ **Modern Non-convex, Non-smooth Optimization**, Fall 2018: Recent methods for approximation and solving non-convex optimization problems.
- ◇ **Statistical Methodology and Machine Learning**, Spring 2018: Advanced Statistics and Linear Algebra and their applications in theoretical machine learning.
- ◇ **Deep Learning**, Fall 2019: Convolutional Neural Networks, Recurrent Neural Networks, Generative Adversarial Nets, Variational Autoencoders.
- ◇ **Analysis of Time Series**: Auto Regressive Moving Average (ARIMA) analysis of time series, understanding trends, seasonality and stationarity in time series, Fall 2020.
- ◇ **Control Theory and Reinforcement Learning**: Theoretical foundations of control theory, game theory, and modern reinforcement learning, Spring 2023.

#### NOTABLE COURSE PROJECTS

- ◇ Design, Implementation and improvement of Memory aware synapses (**LifeLong Learning**), ([Github Link](#)), Deep Learning, Spring 2019.
- ◇ Using **advanced design of experiment** tools for optimizing hyper-parameters of Long-Short Term Memory (LSTM) Networks, Advanced Design of Experiments, Fall 2017.

|                          |   |
|--------------------------|---|
|                          | <ul style="list-style-type: none"> <li>◇ Community Detection on Large-scale graphs via Alternating Direction Method of Multipliers (ADMM), <b>Large Scale Optimization for Machine Learning</b>, Fall 2017.</li> <li>◇ Implementing a lexer and a parser in OCaml, Fall 2015.</li> <li>◇ Discovering significant biological patterns in DNA sequences of Human, Bacteria, and Mammals using Pattern Matching algorithms such as Boyer-Moore and Z-algorithm, <b>Computational Biology</b>, Spring 2019.</li> <li>◇ Implementation of stable generative adversarial networks using Wasserstein distance instead of KL Divergence, <b>Statistical Methodology and Machine Learning</b>, Spring 2018.</li> </ul>   |
| TALKS AND PRESENTATIONS  | <ul style="list-style-type: none"> <li>◇ <b>Sessoïn Chair</b>, "<i>Robust and Fair Machine Learning</i>" at INFORMS Annual Meeting 2023, Phoenix, Arizona.</li> <li>◇ <b>Talk</b>, "<i>Rényi Fair Inference</i>" at INFORMS Annual Meeting 2019, Seattle, Washington.</li> <li>◇ <b>Talk</b>, "<i>A Stochastic Optimization Framework for Fair Risk Minimization</i>" at INFORMS Annual Meeting 2022, Indianapolis, Indiana.</li> <li>◇ <b>Lightening Talk</b>, "<i>Large-scale Optimization and Big Data</i>": Introducing Active Research Areas in Industrial and Systems Engineering PhD Open House, USC, March 2018.</li> <li>● <b>Talk</b>, "<i>Fair and Robust Machine Learning Through Min-Max Optimization</i>" at <b>Google Research</b>, Sep 2022.</li> </ul> |
| PAPER REVIEWS            | <ul style="list-style-type: none"> <li>◇ <b>Journal</b>: IFAC journal Automatica, International Journal of Data Science, Journal of Machine Learning Research (JMLR).</li> <li>◇ <b>Conference</b>: ISIT 2019, AISTATS 2021, NeurIPS 2021, ICLR 2022, NeurIPS 2022, UAI 2023, ICML 2023, NeurIPS 2023, AAAI 2024, ICLR 2024.</li> <li>◇ <b>Workshop</b>: Trustworthy and Socially Responsible Machine Learning, NeurIPS 2022</li> </ul>   |
| PROFESSIONAL MEMBERSHIPS | <ul style="list-style-type: none"> <li>◇ Member of Optimization Society and Operations Research at <b>INFORMS</b></li> <li>◇ Editorial Board Member of International Journal of Data Science (IJDS)</li> </ul>  |
| VOLUNTEER EXPERIENCE     | <ul style="list-style-type: none"> <li>◇ Research Mentor for Undergraduate Students at York University</li> <li>◇ Coordinating group meetings at Machine Learning Center of USC <b>MASCLE</b></li> <li>◇ Mentor in USC <b>IUSSTF-Viterbi Program</b></li> </ul>   |