

Contact Information

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Employment History

- Sep 2022-Present **California Institute of Technology, Pasadena, CA.**
Postdoctoral Scholar
◦ Supervisor: Yisong Yue
- Oct 2020-Mar 2021 **Facebook, Menlo Park, CA.**
Visiting Researcher
◦ Supervisor: Eytan Bakshy
- Jun-Sep 2020 **Facebook, Menlo Park, CA.**
Research Intern
◦ Supervisor: Daniel R. Jiang
- Jun-Aug 2019 **ExxonMobil Upstream Research Company, Houston, TX.**
Jun-Aug 2018 Research Intern
◦ Supervisors: Liz Curry, Damian Burch, and Xiao-Hui Wu

Education

- Jul 2016-Aug 2022 **Cornell University, USA.**
Ph.D. in Operations Research and Information Engineering
◦ Advisor: Peter Frazier
◦ Minors: Computer Science and Statistics
- Aug 2011-Jun 2016 **University of Guanajuato & Center for Research in Mathematics, Mexico.**
B.Sc. in Mathematics. GPA: 9.7/10
◦ Highest GPA of the 2011-2016 class

Research Interests

Bayesian Optimization, Preference Elicitation, Simulation Optimization, Active Learning, Adaptive Experimentation, Uncertainty Quantification, Optimal Learning, AI for Science

Publications and Preprints

1. J. Bowden, [R. Astudillo](#), C. Yeh, J. Song, Y. Chen, Y. Yue, and T. Desautels, "Bayesian optimization with Bayesian deep kernel learning", *Preprint*.
2. V. Mishra, [R. Astudillo](#), P. Frazier, and F. Zhang, "Probably-convergent Bayesian source seeking", *Submitted*.
3. P Buathong, J. Wan, S. Daulton, [R. Astudillo](#), M. Balandat, and P. Frazier, "Bayesian optimization of function networks with partial evaluations", *Submitted*.
4. [R. Astudillo](#), K. Li, M. Tucker, X. Chen, A. Ames, and Y. Yue, "Preferential multi-attribute Bayesian optimization with application to exoskeleton personalization", *Submitted*.

5. J. Jannink, R. Astudillo, and P. Frazier, "Insight into a two-part plant breeding scheme through Bayesian optimization of budget allocations", *To appear in Crop Science*.
6. R. Astudillo, Z. Lin, E. Bakshy, and P. Frazier, "qEUBO: A decision-theoretic acquisition function for preferential Bayesian optimization", *International Conference on Artificial Intelligence and Statistics, 2023*.
7. Z. Cosenza, R. Astudillo, P. Frazier, K. Baar, and D. Block, "Multi-information source Bayesian optimization of culture media for cellular agriculture" (Spotlight presentation at the ICML 2022 Adaptive Experimental Design and Active Learning in the Real World Workshop, 7%), *Biotechnology and Bioengineering, 2022*.
8. Z. Lin, R. Astudillo, P. Frazier, and E. Bakshy, "Preference exploration for efficient Bayesian optimization with multiple outcomes", *International Conference on Artificial Intelligence and Statistics, 2022*.
9. R. Astudillo, and P. Frazier, "Thinking inside the box: A tutorial on grey-box Bayesian optimization", *Advanced Tutorial at the Winter Simulation Conference, 2021*.
10. R. Astudillo, D.R. Jiang, M. Balandat, E. Bakshy, and P. Frazier, "Multi-step budgeted Bayesian optimization with unknown evaluation costs", *Advances in Neural Information Processing Systems, 2021*.
11. R. Astudillo and P. Frazier, "Bayesian optimization of function networks", *Advances in Neural Information Processing Systems, 2021*.
12. S. Cakmak, R. Astudillo, P. Frazier and E. Zhou, "Bayesian optimization of risk measures", *Advances in Neural Information Processing Systems, 2020*.
13. B. Sha, R. Astudillo, and P. Frazier, "Bayesian preference learning for multi-objective optimization" (Finalist at the 2020 INFORMS Undergraduate Operations Research Prize Competition), *Preprint*.
14. R. Astudillo and P. Frazier, "Multi-attribute Bayesian optimization with interactive preference learning", *International Conference on Artificial Intelligence and Statistics, 2020*.
15. R. Astudillo and P. Frazier, "Bayesian optimization of composite functions", *International Conference on Machine Learning, 2019*.

Selected Presentations

- Jan 2023 "Composite Bayesian optimization for efficient and scalable adaptive experimentation", *Online Reading Group on Modern Adaptive Experimental Design and Active Learning in the Real World, Virtual*.
- Dec 2021 "Thinking inside the box: A tutorial on grey-box Bayesian optimization", *Advanced Tutorial at the Winter Simulation Conference, Phoenix, AZ*.
- Oct 2021 "Grey-box Bayesian optimization", *Young Researchers Workshop, Cornell University's School of ORIE, Ithaca, NY*.
- Mar 2021 "Bayesian optimization of function networks", *SIAM Conference on Computational Science and Engineering, Virtual*.
- Feb 2020 "Interactive Bayesian optimization with uncertain preferences", *Facebook Adaptive Experimentation Workshop, New York City, NY*.
- Jul 2019 "Bayesian optimization of composite functions with application to computationally expensive inverse problems", *Applied Inverse Problems Conference, Grenoble, France*.
- Jun 2019 "Bayesian optimization of composite functions", *International Conference on Machine Learning, Long Beach, CA*.

May 2019 "Bayesian optimization of composite functions", *2nd Uber Science Symposium, San Francisco, CA.*

Selected Graduate Coursework

- Applied Stochastic Processes
- Mathematical Programming
- Bayesian Statistics and Data Analysis
- Numerical Methods for Data Science
- Bayesian Machine Learning
- Statistical Learning Theory
- Advanced Machine Learning
- Optimal Learning

Teaching Experience

California Institute of Technology, USA.

Instructor

Spring 2023 Uncertainty Quantification Graduate

Cornell University, USA.

Instructor

Summer 2021 Engineering Stochastic Processes Undergraduate

Cornell University, USA.

Teaching Assistant

Fall 2018 Statistical Principles Graduate

Spring 2017 Engineering Stochastic Processes Undergraduate

Fall 2016 Basic Probability and Statistics Undergraduate

Center for Research in Mathematics, Mexico.

Teaching Assistant

Fall 2015 Measure Theory and Probability Graduate

University of Guanajuato, Mexico.

Teaching Assistant

Spring 2015 Complex Analysis Undergraduate

Fall 2014 Elementary Number Theory Undergraduate

Selected Awards

- 2021 NeurIPS 2021 Outstanding Reviewer Award (8%)
- 2015 Second Prize - XXII International Mathematics Competition for University Students
- 2014 *Orgullo UG* Academic Excellence Award - University of Guanajuato
- 2012-2016 Academic Excellence Fellowship - Center for Research in Mathematics

Academic Service

Conference Reviewing: AISTATS, ICLR, ICML, NeurIPS

Journal Reviewing: Artificial Intelligence, INFORMS Journal on Computing, Neural Computation, Operations Research, Technometrics

Languages

English (proficient), Spanish (native)