

## 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
  - Developed novel adaptive experimentation algorithms and deployed them within Facebook's internal experimentation pipeline
  - Supervisor: Eytan Bakshy
- Jun-Sep 2020 **Facebook, Menlo Park, CA.**  
 Research Intern
  - Developed novel Bayesian optimization algorithms for problems with unknown evaluation costs
  - Mentor: Daniel R. Jiang
- Jun-Aug 2019 **ExxonMobil Upstream Research Company, Houston, TX.**
- Jun-Aug 2018 Research Intern
  - Developed novel Bayesian optimization algorithms for reservoir development planning under geological uncertainty
  - Mentors: 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, Adaptive Experimentation, Optimal Learning

## Publications and Preprints

1. V. Mishra, R. Astudillo, P. Frazier, and F. Zhang, "A probably-convergent algorithm for source seeking under multiple sources", *Preprint*.
2. R. Astudillo, Z. Lin, E. Bakshy, and P. Frazier, "qEUBO: A decision-theoretic acquisition function for preferential Bayesian optimization", *Preprint*.

3. B. Sha, R. Astudillo, and P. Frazier, "Mixed integer linear programming under preference uncertainty " (Finalist at the 2020 INFORMS Undergraduate Operations Research Prize Competition), *Preprint*.
4. Z. Cosenza, R. Astudillo, P. Frazier, 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.
5. 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.
6. R. Astudillo, and P. Frazier, "Thinking inside the box: A tutorial on grey-box Bayesian optimization", *Advanced Tutorial at the Winter Simulation Conference*, 2021.
7. 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.
8. R. Astudillo and P. Frazier, "Bayesian optimization of function networks", *Advances in Neural Information Processing Systems*, 2021.
9. S. Cakmak, R. Astudillo, P. Frazier and E. Zhou, "Bayesian optimization of risk measures", *Advances in Neural Information Processing Systems*, 2020.
10. R. Astudillo and P. Frazier, "Multi-attribute Bayesian optimization with interactive preference learning", *International Conference on Artificial Intelligence and Statistics*, 2020.
11. R. Astudillo and P. Frazier, "Bayesian optimization of composite functions", *International Conference on Machine Learning*, 2019.
12. R. Astudillo and P. Frazier, "Multi-attribute Bayesian optimization under utility uncertainty", *NIPS Workshop on Bayesian Optimization*, 2017.

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## Selected Presentations

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| Dec 2021 | "Thinking inside the box: A tutorial on grey-box Bayesian optimization", <i>Advanced Tutorial at the Winter Simulation Conference, Phoenix, AZ</i> .                          |
| Dec 2021 | "Multi-step budgeted Bayesian optimization with unknown evaluation costs", <i>NeurIPS 2021, Virtual</i> .                                                                     |
| Oct 2021 | "Grey-box Bayesian optimization", <i>Young Researchers Workshop, Cornell University's School of ORIE, Ithaca, NY</i> .                                                        |
| Mar 2021 | "Bayesian optimization of function networks", <i>SIAM Conference on Computational Science and Engineering, Virtual</i> .                                                      |
| Feb 2020 | "Interactive Bayesian optimization with uncertain preferences", <i>Facebook Adaptive Experimentation Workshop, New York City, NY</i> .                                        |
| Jul 2019 | "Bayesian optimization of composite functions with application to computationally expensive inverse problems", <i>Applied Inverse Problems Conference, Grenoble, France</i> . |
| Jun 2019 | "Bayesian optimization of composite functions", <i>International Conference on Machine Learning, Long Beach, CA</i> .                                                         |
| May 2019 | "Bayesian optimization of composite functions", <i>2nd Uber Science Symposium, San Francisco, CA</i> .                                                                        |

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## 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

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## Teaching Experience

**Cornell University, USA.**

Instructor

Summer 2021	Engineering Stochastic Processes	Undergraduate
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**Cornell University, USA.**

Teaching Assistant

Fall 2018	Statistical Principles	Graduate
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Spring 2017	Engineering Stochastic Processes	Undergraduate
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Fall 2016	Basic Probability and Statistics	Undergraduate
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**Center for Research in Mathematics (CIMAT), Mexico.**

Teaching Assistant

Fall 2015	Measure Theory and Probability	Graduate
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**University of Guanajuato, Mexico.**

Teaching Assistant

Spring 2015	Complex Analysis	Undergraduate
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Fall 2014	Elementary Number Theory	Undergraduate
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## 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

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## Academic Service

Conference Reviewing: AISTATS, ICLR, ICML, NeurIPS

Journal Reviewing: Artificial Intelligence, Neural Computation, Operations Research

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## Languages

English (proficient), Spanish (native)