| Contact Information | baek@stern.nyu.edu | http://www.mit.edu/~baek/ |
|---------------------|-------------------|--------------------------|
| Employment          | New York University, Stern School of Business | 2023 - Assistant Professor, Technology, Operations & Statistics |
|                     | Simons Institute for the Theory of Computing, UC Berkeley | Fall 2022 Research Fellow in the program Data-Driven Decision Processes |
| Education           | Massachusetts Institute of Technology | 2016 - 2022 Ph.D. in Operations Research, GPA: 5.0/5.0 Thesis: Decision-Making Under Uncertainty: From Theory to Practice Advisor: Vivek Farias |
|                     | University of Waterloo | 2011 - 2016 Bachelor of Mathematics, GPA: 93.0/100.0 Joint Honours Computer Science & Combinatorics and Optimization |
| Interests           | Online decision-making, algorithmic fairness, machine learning, data-driven analytics |
| Papers              | **1. Fair Exploration via Axiomatic Bargaining** with Vivek Farias Preliminary version: NeurIPS 2021 (Spotlight, top 3% of submissions)  
  * Second Place, MSOM Student Paper Competition 2022  
  * Finalist, George Nicholson Student Paper Competition 2021  
  * Finalist, RMP Jeff McGill Student Paper Award 2021  
  * Honorable Mention, MIT ORC Best Student Paper Competition 2021  
  * Oral presentation, 1st ACM Conference on Equity & Access in Algorithms, Mechanisms, & Optimization, 2021 |
|                     | **2. The Limits to Learning a Diffusion Model** with Vivek Farias, Andreea Georgescu, Retsef Levi, Tianyi Peng, Deeksha Sinha, Joshua Wilde, Andrew Zheng Preliminary version: 22nd ACM conference on Economics and Computation, 2021  
  * Finalist, Post-Pandemic Supply Chain and Healthcare Management Best Paper Competition 2021 |
|                     | **3. Evaluation of individual and ensemble probabilistic forecasts of COVID-19 mortality in the US** with COVID-19 Forecast Hub Proceedings of the National Academy of Sciences, 2022  
  - This paper resulted from contributing COVID-19 forecasts (from the paper “The Limits to Learning a Diffusion Model”) to the COVID-19 Forecast Hub |
|                     | **4. TS-UCB: Improving on Thompson Sampling With Little to No Additional Computation** with Vivek Farias Submitted |
|                     | **5. Bifurcating Constraints to Improve Approximation Ratios for Network Revenue Management with Reusable Resources** |
with Will Ma
*Operations Research*, 2022 (Articles in Advance)
Preliminary version: *12th International Symposium on Algorithmic Game Theory*, 2019

6. A Game-Theoretic Analysis of Reallocation Mechanisms for Airport Landing Slots
with Hamsa Balakrishnan
*IEEE Transactions on Intelligent Transportation Systems*, 2020

**Teaching Experience**

**Operations Management (15.778)**

*Teaching Assistant* for Sloan Fellows MBA Students
Summer 2020

**The Analytics Edge (15.071)**

*Teaching Assistant* for MBA Students
Spring 2018

**Computing in Optimization and Statistics (15.S60)**

*Instructor* for a 3-hour lecture on computing tools for PhD students
2017, 2018

**Work Experience**

**GRAIL**

*Machine Learning Engineer Intern*
Summer 2018

Investigated genomic features on its ability to improve detecting early-stage cancer

**Snap**

*Software Engineer Intern*
Fall 2014, Summer 2016

Improved app startup performance by implementing incremental updates

**Bloomberg**

*Software Engineer Intern*
Fall 2015

Optimized a financial dashboard using a dependency graph to minimize redundant function calls

**Dropbox**

*Software Engineer Intern*
Fall 2013, Spring 2014

Optimized sync by implementing delta compression using finite-state machines

**LogicBlox**

*Software Engineer Intern*
Spring 2013

**Axentra**

*Software Engineer Intern*
Summer 2012

**Service**

Reviewer for Journals: *Operations Research, Management Science, Manufacturing & Service Operations Management, Operations Research Letters, European Journal of Operational Research, Journal of Machine Learning Research, IEEE Control Systems Letters, IEEE Transactions on Intelligent Transportation Systems, INFORMS Journal on Computing*

Program Committee/Reviewer for Conferences: *FAccT 2022/2023, WINE 2022, ALT 2023, The Web Conference 2023, AISTATS 2023*

Session Chair, INFORMS Annual Meeting
2021, 2022

Student Coordinator, MIT ORC Seminar Series
Fall 2020

Student Coordinator, MIT OM Seminar Series
Spring 2020
Talks

Fair Exploration via Axiomatic Bargaining
Northwestern Kellogg, Columbia IEOR, USC Marshall, Johns Hopkins Carey, 2022
NYU Stern, Stanford GSB, Duke Fuqua, Yale SOM, Michigan Ross, Chicago Booth, Rotman Young Scholar Seminar, Caltech RSRG
UPenn Wharton, UBC Sauder, UNC Kenan-Flagler, Cornell ORIE, 2021
Data Science Lab Seminar (MIT), Cornell Young Researchers Workshop, Marketplace Innovation Workshop, MSOM Conference, RMP Conference

The Limits to Learning a Diffusion Model
Healthcare Operations SIG Meeting 2021
ACM conference on Economics and Computation 2021

TS-UCB: Improving on Thompson Sampling With Little to No Additional Computation
INFORMS Annual Meeting 2020

Bifurcating Constraints to Improve Approximation Ratios for (Reusable) Network Revenue Management
INFORMS Annual Meeting 2019
Revenue Management and Pricing 2019
POMS Annual Conference 2019

Mechanism Design for Airport Landing Slot Exchange
LIDS Student Conference 2018
Runner-up, Best Presentation Award
INFORMS Annual Meeting 2018

Honors and Awards
Second Place, MSOM Student Paper Competition 2022
Finalist, George Nicholson Student Paper Competition 2021
Finalist, RMP Jeff McGill Student Paper Award 2021
Honorable Mention, MIT ORC Best Student Paper Competition 2021
Finalist, Post-Pandemic Supply Chain and Healthcare Management Best Paper Competition 2021
Runner-up, MIT LIDS Student Conference Best Presentation 2018
NSERC Undergraduate Student Research Award 2015
Professional Education Foundation Scholarship, University of Waterloo 2014
Mathematics National Scholarship, University of Waterloo 2011 - 2016

Volunteer Experience
COVID-19 Alliance Senior Support Team of New Hampshire
Data Scientist 2020 - 2021
Built and deployed an automated communication system (SMS and email) with all senior residential facilities in NH, used daily from April 2020 to June 2021

Sidney-Pacific Graduate Student Residence (MIT)
Brunch Chair 2016 - 2018
Led a group of ~50 volunteers every month to cook brunch for 300+ residents

Other
Citizenship: Canadian
Hobbies: squash, running, snowboarding, basketball