Jiayue Wan

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EDUCATION

Cornell University, College of Engineering, Ithaca, NY — Expected May 2023
- Ph.D. in Operations Research and Information Engineering, GPA: 4.13/4.3
- Skills: Machine Learning, Bayesian Optimization, Experimental Design, Causal Inference, Stochastic Modeling, Simulation

Stanford University, School of Engineering, Stanford, CA — June 2018
- M.S. in Management Science and Engineering, GPA: 4.07/4.3

Haverford College, Haverford, PA — May 2016
- B.S. in Mathematics and Physics, *magna cum laude*, Phi Beta Kappa, GPA: 3.96/4

PROFESSIONAL EXPERIENCE

Cornell University, Ithaca, NY — April 2020 – present
Data Scientist, COVID-19 Pandemic Response, reporting to the Provost
- Guided Cornell's president and provost on whether to reopen for in-person instruction and what interventions to use, achieving a daily incidence of 0.01% in the 2020-21 academic year among 34K Cornell students and employees
- Developed a Python compartmental simulation model (https://github.com/peter-i-frazier/group-testing) to predict epidemiological outcomes in college environments, whose output influenced policies at Cornell, Stanford, Duke, University of Wisconsin - Madison, Boston University, Johns Hopkins, Yale, and several other universities
- Led retrospective parameter estimation and model calibration analysis for the 2020-21 academic year using SQL, Python and Bayesian machine learning to support improvements to Cornell's asymptomatic screening program
- Led analysis of the risk of infection during travel to support travel policy decisions and communication with stakeholders by performing causal inference on data from 18K students
  Reports of all analyses are published online at https://covid.cornell.edu/testing/modeling/.
  Media coverage by ABC News, Wall Street Journal, Forbes, Asahi Shimbun.

Cardinal Operations, Shanghai, China — June 2017 – September 2017
Algorithm Engineer Intern
- Led a consulting engagement with Budweiser, designing and implementing operations research software for managing warehouse operations in Python and CPLEX
- Designed and implemented clustering and vehicle routing algorithms in Python and delivered business region partition, facility location and route planning solutions for SF Express, a large courier company

RESEARCH EXPERIENCE

COVID-19 Mathematical Modeling
- Formulated a general theoretical framework for correlation in pooled testing to investigate its effect on sensitivity and efficiency and refine the scientific community's understanding of its ability to control epidemics
- Led analysis of vaccine effectiveness in response to queries from the CDC and NYC Health Department using Python and SQL

Bayesian Optimization with Applications in Materials Design
- Designed and implemented novel Bayesian optimization algorithms in settings of importance by drug discovery and materials design where calculating features is slow
- Developed efficient sequential experimental design algorithms, using Bayesian machine learning for materials discovery, focused on preventing ice growth on airplane wings, in collaboration with experts in molecular simulation and biochemistry

Water Supply Network Optimization
- Formulated a multi-period model solving for flow and pressure required for a large water supply network with 8K+ nodes and edges, in collaboration with Siemens Corporate Technology
- Implemented MIP optimization algorithms using Julia and Python

PUBLICATIONS & WORKING PAPERS

Frazier et al., Modeling for COVID-19 College Reopening Decisions: Cornell, A Case Study. *Proceedings of the National Academy of Sciences*, 19(2) e2112532119 (2022).

J. Wan, Y. Zhang, P.I. Frazier, Correlation Improves Group Testing. Submitted.

Wan et al., Boosters Protect Against SARS-CoV-2 Omicron Infection in Young Adults. Submitted.

Lin et al., Group Testing Enables Asymptomatic Screening for COVID-19 Mitigation: Feasibility and Optimal Pool Size Selection with Dilution Effects. Submitted.

LEADERSHIP & SKILLS

Co-President, Operations Research Graduate Student Association (ORGA) — 2020 - 2021
Programming: Python (PyTorch, NumPy, SciPy, Scikit-Learn, Pandas), R, SQL, MATLAB, Julia
Languages: English, Mandarin Chinese, Shanghainese