CONNOR COLOMBE

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EDUCATION

The University of Texas at Austin — Austin, TX, USA
PhD, Operations Research and Industrial Engineering, GPA: 3.9/4.0 — *2020 – Exp. 2026*
- Advisor: Ben Leibowicz
- Thesis: *Optimization Models for Green Technology Development*

The University of Texas at Dallas — Richardson, TX, USA
MS, Computer Science, GPA: 4.0/4.0 — *2018 – 2020*
- Advisor: Emily Kyle Fox
- Thesis: *Approximating the Continuous Fréchet Distance*

Harvey Mudd College — Claremont, CA, USA
BS, Joint Physics and Mathematics, GPA: 3.3/4.0 — *2014 – 2018*

RESEARCH INTERESTS

Methodology: Optimization (Continuous, Discrete, and Stochastic), Algorithm Design, Analytical Modeling, Game Theory and Mechanism Design, Markov Decision Processes, Applied Probability, Decision Analysis.

Applications: Emerging Technology (Carbon Capture), Energy, Electric Grid Resilience.

HONORS AND AWARDS

- Best Student Paper Award, IISE Energy Systems Division — *2025*
- University Graduate Continuing Fellowship — *2025*
- Temple Foundation Graduate Fellowship — *2024*
- Dennis J. O'Brien USAEE Best Student Paper Award — *2023*
- Cockrell School of Engineering Graduate Fellowship — *2020-2024*
- Harvey Mudd College Dean's List — *2016-2018*
- National AP Scholar — *2014*

PAPERS

Published Papers

(P1) Connor Colombe, Benjamin D. Leibowicz, Benjamin R. Mendoza, *The effects of policy uncertainty and risk aversion on carbon capture, utilization, and storage investments*, **Energy Policy**, Volume 192, 2024, DOI 10.1016/j.enpol.2024.114212.
- *Dennis J. O'Brien USAEE Best Student Paper Award, 2023*

(P2) Balasubramanian Sambasivam, Connor Colombe, John J. Hasenbein, Benjamin D. Leibowicz, *Optimal resource placement for electric grid resilience via network topology*, **Reliability Engineering & System Safety**, Volume 245, 2024,
DOI: 10.1016/j.ress.2024.110010

(P3) Connor Colombe and Emily Kyle Fox. *Approximating the (continuous) fréchet distance*. In 37th **International Symposium on Computational Geometry** (SoCG 2021). Leibniz International Proceedings in Informatics (LIPIcs), Volume 189, pp. 26:1-26:14
DOI:10.4230/LIPIcs.SoCG.2021.26

Papers Under Review

(U1) Connor Colombe and Benjamin D. Leibowicz, *Optimal subsidies for carbon capture: A Stackelberg game analysis* (Posted Online March 06, 2025). DOI: 10.2139/ssrn.5168632

- *IISE Energy Systems Division Best Student Paper Award, 2025*

Papers in Preparation

(C1) J. Eric Bickel, Connor Colombe, Benjamin D. Leibowicz, *Q-Flex: A Novel system for quantile-parametrized distributions*.

(C2) Connor Colombe, Benjamin D. Leibowicz, *Optimal Stopping for R&D investments in competitive markets*.

WORK EXPERIENCE

Quantitative Researcher *Summer 2024 - Spring 2025*
Teachers Retirement System, Austin, Texas

- Developed a novel nonlinear portfolio optimization model for trading FX forward contracts that is robust to outlier signal components and implemented the model in Pyomo.
- The new model improved upon the previous strategy as demonstrated across numerous backtests, and was deployed to production.
- Reproduced a recently published machine learning research paper's results, helping to validate it for future use at TRS.

NASA Jet Propulsion Laboratory Internship *Summers 2016 & 2017*
NASA JPL, Pasadena, California

- Investigated and characterized the performance of software designed to identify earthquake parameters based on spatial shifts in a network of GPS sensors.
- The software had not been extensively validated.
- Created numerous artificial fault models and synthetic GPS data for a variety of conditions (noisy data, different-sized data sets, different spacing between data points, etc.).
- Identified scenarios where the software successfully parameterized faults and proposed actionable improvements.

RELEVANT COURSEWORK

Math/OR: Numerical Analysis, Real Analysis, Linear Programming, Integer Programming, Non-Linear Programming, Decision Analysis, Applied Stochastic Processes, Optimization Under Uncertainty, Systems Modeling, Markov Decision Processes

CS: Algorithmic Game Theory, Computational Geometry, Randomized Algorithms, Combinatorics and Graph Theory, Approximation Algorithms, Machine Learning

COMPUTER SKILLS

Programming	Advanced Python; Experience with Java, HTML, Prolog, and SQL
Software & Tools	Proficient in Mathematica, Matlab, Pandas, Pyomo, LaTeX, MS Office

TEACHING AND MENTORSHIP

Teaching Assistant: Business Analytics and Decision Modeling *Spring 2024, 2025*
University of Texas at Austin, McCombs School of Business

- TA for Graduate courses on decision analysis and modeling for the Executive MBA program.
- Guided breakout sessions, held weekly office hours, graded assignments and exams.
- Class sizes: 65 students and 62 students.
- Given a sample size of $N = 32$, I scored at least a $4.8/5$ on each of the following course evaluation criteria: Availability, communication of subject matter, clarity of communication, and engagement.

Teaching Assistant: Decision Engineering Graduate Course *Fall 2024*
University of Texas at Austin, Cockrell School of Engineering

- Managed and guided breakout sessions, answered students' questions in class, held weekly office hours, graded assignments, proctored and graded final exams.

Freshman Introduction to Research in Engineering (F.I.R.E) Program Mentor *Fall 2024*
University of Texas at Austin, Cockrell School of Engineering

- Served as a research mentor to a team of first-year engineering students.
- Introduced the fundamentals of linear programming and Python-based mathematical modeling.
- Guided students in deriving and developing new features for existing optimization models and code.
- The students were able to formulate their own research questions, develop and implement their own MIP models, and present their results in a course presentation.

Undergraduate Research Mentor *Fall 2022, Spring 2023, Fall 2023*
University of Texas at Austin, Cockrell School of Engineering

- Mentored undergraduate students interested in operations research (OR) and CCUS modeling.
- Held weekly meetings, teaching foundational OR concepts, math, and coding skills.
- Provided project-based guidance, resulting in students' tangible contributions to a CCUS modeling that culminated in an end-of-semester paper and presentation.

SERVICE AND LEADERSHIP

UT ORIE Problem Seminar and Interview Prep *Spring 2023–Present*
University of Texas at Austin

- Organize and host a weekly math- and programming-focused problem-solving seminar.
- Curate challenging problems, emphasizing generalizable intuition, problem-solving strategies, and the enjoyment of mathematical puzzles!
- Some of our past problems can be found here: ORIE Problem Seminar

UT Austin INFORMS Student Chapter *Fall 2020–Present*
University of Texas at Austin

- Chapter President (2021–2022, 2023–2024) and Vice President (2022–2023, 2024–2025) overseeing a 15-student leadership team and coordinating chapter activities.
- Active member since Fall 2020, contributing to networking events, technical skill-building workshops, and volunteer initiatives.

TALKS

Optimal Subsidies for Carbon Capture: A Stackelberg Game Analysis (U1)

- INFORMS Annual Meeting, Atlanta, GA *2025*
- IISE Annual Conference, Atlanta, GA *2025*
  IISE Energy Systems Division Best Student Paper Award
- UT ORIE Student Research Seminar, Austin, TX *2025*

- INFORMS Annual Meeting, Seattle, WA *2024*

The Effects of Policy Uncertainty and Risk Aversion on Carbon Capture, Utilization, and Storage Investments (P1)

- The Economics of Scaling CCUS Symposium, Austin, TX *2024*
- USAEE North American Conference, Chicago, IL *2023*
  Dennis J. O'Brien USAEE Best Student Paper Award, 2023
- INFORMS Annual Meeting, Indianapolis, IN *2022*

Approximating the (Continuous) Fréchet Distance (P3)

- The 37th International Symposium on Computational Geometry, Virtual *2021*

TECHNICAL INTERESTS

Outside of formal research and work, I am deeply interested in mathematical problem-solving and programming. I continuously seek out challenging problems to sharpen my skills and document some of the problems I enjoy on my personal math blog: https://ccolombe12.github.io/blog/. Some of my technical hobby achievements include:

- **Competitive Programming:** Ranked in the top 1.7% globally in LeetCode contests.
- **Recreational Math:** Solved over 190 problems on Project Euler (top 0.3%).