CONNOR COLOMBE

Email: Ccolombe@UTexas.edu, Website: https://ccolombe12.github.io

EDUCATION

The University of Texas at Austin, Texas	*August 2020 - Present*
Doctor of Philosophy, Operations Research	GPA 3.92
The University of Texas at Dallas, Texas	*August 2018 - July 2020*
Master of Science, Computer Science	GPA 4.0
Harvey Mudd College, California	*August 2014 - May 2018*
Bachelor of Science, Joint Physics and Mathematics	GPA 3.3

RELEVANT COURSEWORK

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

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

COMPUTER SKILLS

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

HONORS AND AWARDS

Continuing Education Graduate Fellowship	*Spring 2025–Spring 2026*
Temple Foundation Graduate Fellowship	*Fall 2024–Spring 2025*
Best Student Paper Award, USAEE Conference	*Fall 2023*
Cockrell School of Engineering Graduate Fellowship	*Fall 2020–Spring 2024*
Harvey Mudd College Dean's List	*Fall 2016 – Spring 2018*
National AP Scholar	*Spring 2014*

PUBLICATIONS

Optimal subsidies for carbon capture: A Stackelberg game analysis Connor Colombe and Benjamin Leibowicz. *European Journal of Operations Research, 2025 (In Review).*

The Effects of Policy Uncertainty and Risk Aversion on Carbon Capture, Utilization, and Storage Investments Connor Colombe and Benjamin Leibowicz. *Energy Policy 2024.*

Optimal Resource Placement for Electric Grid Resilience via Network Topology Balasubramanian Sambasivam, Connor Colombe, John Hasenbein, Benjamin Leibowicz. *Reliability Engineering & System Safety 2024.*

Approximating The (Continuous) Fréchet Distance Connor Colombe and Emily Kyle Fox. *SOCG 2021.*

CONFERENCE PRESENTATIONS

Optimal Subsidies for Carbon Capture and Storage
INFORMS Annual Meeting, 2024, Seattle, WA

The Effects of Policy Uncertainty and Risk Aversion on Carbon Capture, Utilization, and Storage Investments
40th USAEE/IAEE North American Conference, 2023, Chicago, IL
Winner of the 2023 Dennis J. O'Brien USAEE Best Student Paper Award

The Effects of Policy Uncertainty and Risk Aversion on Carbon Capture, Utilization, and Storage Investments
INFORMS Annual Meeting, 2022, Indianapolis, IN

Approximating the (Continuous) Fréchet Distance
The 37th International Symposium on Computational Geometry, 2021, Virtual

RESEARCH EXPERIENCE

Graduate Research Assistant　　　　　　　　　　　　　*Fall 2021–Present*
Operations Research Department, University of Texas at Austin

- Develop novel mathematical models for carbon capture, utilization, and storage (CCUS) under the guidance of Professor Benjamin Leibowicz.
- Design large-scale optimization frameworks and apply game-theoretic methods to identify barriers to CCUS development and propose effective subsidy strategies.
- Collaborate with Professor Eric Bickel to create a new family of probability distributions parameterized by arbitrary input quantiles, enabling more precise decision-maker belief assessments.

Theoretical Computational Geometry Research　　　　*Fall 2019–Summer 2020*
Department of Computer Science, University of Texas at Dallas

- Worked with Professor Emily Fox to develop a fast algorithm for approximating the Fréchet distance between polygonal chain curves.
- Leveraged recent improvements in discrete cases to devise a novel approximation algorithm for the continuous setting.
- Incorporated the findings into a thesis paper; results were published in SoCG 2021.

Brain Patch Project　　　　　　　　　　　　　　　*Fall 2016–Spring 2018*
Departments of Physics and Engineering, Harvey Mudd College

- Collaborated across two departments to develop a novel treatment for traumatic brain injuries using chitosan nanoparticles.
- Led a three-student lab group by training new members and setting research objectives.
- Experimentally confirmed the antibacterial properties of chitosan nanoparticles, validating their use in the project.
- Investigated minimum nanoparticle concentration for achieving antibacterial thresholds and established a methodology for accurate nanoparticle size measurement.
- Presented findings in a thesis and departmental conference.

WORK EXPERIENCE

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

- Developed a novel non-linear 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 pushed into production.
- Currently researching novel ML methods for improving current commodity trading strategies.

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

- Investigated and characterized the performance of software designed to identify earthquake parameters based on spatial shifts in a network of GPS sensors. The software's performance had not been extensively validated.
- Created numerous artificial fault models and synthetic GPS data for a variety of different 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

Individual Tutor
Harvey Mudd College
Fall 2017-Spring 2018

- Assigned by the college to be a private tutor for students struggling in physics and math courses.
- Worked one-on-one with students, having them communicate their thought processes during active problem-solving to target specific gaps in understanding.
- Built student intuition by systematically and naturally building up from mutually understood first principles.
- Students self-reported improvements in relevant coursework.

SERVICE, MENTORSHIP, AND TEACHING

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

- Organize a weekly math-focused problem-solving seminar, inspired by the Putnam Seminar at Harvey Mudd College.
- Curate challenging math and programming problems, emphasizing generalizable intuition and problem-solving strategies.

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

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

F.I.R.E. Program Mentor
University of Texas at Austin
Fall 2024

- Served as a graduate mentor to a team of first-year engineering students.
- Introduced the fundamentals of linear programming, Python-based mathematical modeling, and CCUS infrastructure analysis.
- Guided students in adding new features to existing research code, enabling them to investigate independent research questions. The students were able to answer their research questions and presented their results in their course final presentation.

Undergraduate Research Mentor
University of Texas at Austin
Fall 2022, Spring 2023, Fall 2023

· Mentored undergraduates interested in operations research and CCUS modeling, covering foundational concepts and coding skills.
· Provided project-based guidance, resulting in students' tangible contributions to CCUS modeling research.

Teaching Assistant: Decision Engineering MBA Course *Spring 2024, Spring 2025*
University of Texas at Austin

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

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 notable solutions on my personal blog: https://ccolombe12.github.io/blog/. Some of my technical hobby achievements include:

- **Competitive Programming:** Ranked in the top 3.7% globally in LeetCode contests.

- **Recreational Math:** Solved over 175 problems on Project Euler (top 0.38%).