

CONNOR COLOMBE

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

EDUCATION

The University of Texas at Austin, Texas	<i>August 2020 - Present</i>
Doctor of Philosophy, Operations Research	GPA 3.92
The University of Texas at Dallas, Texas	<i>August 2018 - July 2020</i>
Master of Science, Computer Science	GPA 4.0
Harvey Mudd College, California	<i>August 2014 - May 2018</i>
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, L ^A T _E X, and MS Office

HONORS AND AWARDS

Temple Foundation Graduate Fellowship, Fall 2024 - Spring 2025
Best Student Paper Award at United States Association for Energy Economics Conference, Fall 2023
UT Austin Cockrell School of Engineering Graduate Fellowship: Fall 2020 - Spring 2024
Harvey Mudd College Dean's List: Fall 2016, Spring 2017, Fall 2017, Spring 2018
National AP Scholar, Spring 2014

PUBLICATIONS

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

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

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

RESEARCH EXPERIENCE

Graduate Research Assistant *Fall 2021-Present*
Operations Research department, University of Texas at Austin

- Working with Professor Benjamin Leibowicz to develop novel OR models for Carbon Capture Storage and use them to gain insight into barriers to CCUS infrastructure development.

- My current research uses a game-theoretic framework to determine the optimal subsidy policy for deploying CCUS technology.
- I am also working with Professor Eric Bickel on designing a novel family of probability distributions that can be parametrized by an arbitrary set of input quantiles, which would allow decision makers to more accurately assess their beliefs.

Theoretical Computational Geometry Research

Fall 2019-Summer 2020

CS department, University of Texas at Dallas

- Worked with Professor Emily Fox to develop a fast new algorithm for approximating the Fréchet distance between two polygonal chain curves. The result was used for my thesis paper and published in SOCG 2021.

Brain Patch Project

Fall 2016-Spring 2018

Physics + Engineering department, Harvey Mudd College

- Collaborated with two departments to develop a novel treatment of traumatic brain injuries using chitosan nanoparticles.
- Led a three-student lab group in which I trained new members and set project objectives.
- Experimentally confirmed that chitosan nanoparticles exhibited antibacterial properties which validated their inclusion in the project.
- Researched the minimum concentration of nanoparticles necessary to achieve antibacterial threshold and developed a methodology for effectively measuring nanoparticle size.
- Used results for a thesis and presentation.

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

Summer 2016 & Summer 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'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

Fall 2017-Spring 2018

Harvey Mudd College

- 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 AND TEACHING

UT ORIE Problem Seminar and Interview Prep

Spring 2023 - Present

University of Texas at Austin

Run a weekly mathematical problem-solving seminar loosely based on the Putnam Seminar at HMC.

Curate a weekly problem set of challenging math and programming problems and discuss solutions and strategies for solving the problems and the end of the seminar with a focus on intuition and heuristics that can be generalized to solving future problems.

UT Austin Informs Student Chapter

Fall 2020-Present

An active member of the INFORMS chapter at UT since the Fall of 2020. The organization is focused on student involvement in networking events, building technical skills, and volunteer work.

- Served as chapter President for both the 21-22 and 23-24 academic calendars and managed a team of 15 students.

Teaching Assistant: Decision Engineering MBA Course

Spring 2024

UT Austin

Teaching Assistant: Decision Engineering Graduate Course

Fall 2024

UT Austin

TECHNICAL INTERESTS

In my personal time, I am passionate about mathematical problem solving and programming. I enjoy the process of tackling challenging problems and continuously seek opportunities to refine my skills. I document particularly interesting problems and their solutions on my blog, which can be found at <https://ccolombe12.github.io/blog/>. Some of my technical hobby achievements include:

- **Competitive Programming:** Ranked in the top 5.78% globally in Leetcode contests.
- **Recreational Math:** Solved over 175 problems on Project Euler (top 0.38%).