

Hugo Mainguy

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Education

UNIVERSITY OF MARYLAND, COLLEGE PARK, MD

Expected Graduation May 2028

- PhD in Operations Management / Management Science
- Working with Bruce Golden, Luca Bertazzi
- Vehicle routing and transportation, redistricting, NP-Hard approximations

CORNELL UNIVERSITY, ITHACA, NY

Graduated May 2023

- M.S., Operations Research and Information Engineering
- Worked with Nikhil Garg and Andrea Lodi on congestion pricing

STONY BROOK UNIVERSITY, STONY BROOK, NY

Graduated May 2021

- B.S., Applied Mathematics and Statistics, Mathematics, Honors College President
- Significant graduate coursework in Operations Research and Statistics
- Minor in Music Theory

Research Experience

ESTIMATING OPTIMAL KNAPSACK PROBLEM SOLUTION VALUES

June 2023 - Present

- Works with Profs. Bruce Golden and Luca Bertazzi (Università degli Studi di Brescia), uses regression and machine learning in order to best predict solutions to hard knapsack and NP-Hard problems.

A MIXED-INTEGER APPROACH TO MULTI-OBJECTIVE REDISTRICTING

September 2023 – May 2024

- Works with Prof. Raghu Raghavan, developing a mixed integer program in order to build fair districting maps weighing several objectives (e.g. compactness, competitiveness, county splits, fairness).

CONGESTION PRICING MODEL ELABORATION STUDY

January 2022 – May 2023

- Worked with Profs. Nikhil Garg, Andrea Lodi and PhD student Natthawut Boonsiriphatthanajaroen collaborating with ClearRoad in order to establish a tolling system in Bogotá, Colombia. Used OSM data and Python to exploit individual level data and designed surveys sent to users to determine utility of alternate paths and willingness to pay to implement tolls maximizing throughput and social welfare, along with choice modelling to exploit the data.

COMPUTATIONAL GEOMETRY INDEPENDENT STUDY / RESEARCH GROUP

January 2020 – May 2021

- Worked under Prof. Joseph Mitchell and PhD student Logan Graham. Focused on the Traveling Salesman Problem, including maximum/minimum area polygonization, the importance of the nearest neighbor, Minimum Spanning Tree, Gabriel and Delaunay graphs in building an optimal TSP (tour and path).

Work Experience

MATHEMATICS TEACHING ASSISTANT, ITHACA & STONY BROOK, NY

August 2019 – Present

- Teaching Assistant for MATH 1910 – Calculus II for Engineers, ORIE 3120 – Tools for OR, ML and Data Science, AMS 301 – Finite Mathematical Structures and AMS 303 – Graph Theory, holds weekly recitations, office hours and grades homework, is a connection between the professor and the students. Additionally, works as a course grader for MAT 211 – Introduction to Linear Algebra and MAT 127 – Calculus C.

January 2019 – May 2019

PEER-ASSISTED LEARNING LEADER, STONY BROOK, NY

- Hosts PAL Sessions, offers weekly assistance for students taking Calculus A, emphasizing both group work and individual learning. Frequent contact with professor and two other PAL Leaders.

ASTC LEAD TUTOR, STONY BROOK, NY

September 2018 – May 2021

- Tutors calculus I and II, graph theory, combinatorics, upper division probability and statistics, operations research and computational geometry, works on concepts and problems in weekly hour-long one-on-one meetings.
- Extra Lead Tutor responsibilities: guides newer tutors by shadowing and giving feedback, helps with trainings and hiring fairs, and communicates information between employers and other tutors, since September 2019.

Activities and Leadership

OPERATIONS RESEARCH GRADUATE ASSOCIATION CO-PRESIDENT

August 2022 – May 2023

- Coordinates departmental initiatives for the department, improving student and department life.

Skills

Computer skills: Python (main language – including Pandas, Networkx and more), Gurobi, SQL, R, Unix
Language skills: Fluent French and English, advanced Spanish and German, basic Polish