EL GHALI ZERHOUNI

22 Suffolk Street, Cambridge, MA 02139
(857) 869-5121 | egaz@mit.edu | egaz.mit.edu

EDUCATION

MASSACHUSETTS INSTITUTE OF TECHNOLOGY Cambridge, MA
Doctor of Philosophy in Operations Research (GPA: 4.9/5.0) 2020-Present
• Relevant Coursework: Machine Learning, Hands-On Deep Learning, Dynamic Programming and Reinforcement Learning, Integer and Robust Optimization, Fundamentals of Probability, Time Series Analysis, Supply Chain, Inventory and Revenue Management

Master of Business Analytics, Sloan School of Management (GPA: 5.0/5.0) 2019-2020
• Relevant Coursework: Machine Learning Under a Modern Optimization Lens, Optimization Methods, Analytics Edge

ÉCOLE POLYTECHNIQUE Paris, France
Master of Science in Applied Mathematics (GPA: 3.9/4.0) 2016-2019
• Relevant Coursework: Statistics, Probability, Real Analysis, Game Theory, Numerical Approximation and Optimization, Massive Data Processing, Operations Research, Software Engineering, Macro and Micro Economics, Quantum and Statistical Physics

LYCÉE MICHEL DE MONTAIGNE Bordeaux, France
Mathematics, Physics, Computer Science (GPA: 4.0/4.0) 2014-2016
• Preparation study for highly selective entrance exams to French Grandes Écoles

RESEARCH EXPERIENCE

MASSACHUSETTS INSTITUTE OF TECHNOLOGY Cambridge, MA
Doctoral Research Assistant, Operations Research Center 2020-2024
• Advisor: Prof. Retsef Levi
• Research Interests: machine learning algorithms, optimization under uncertainty, stochastic processes and causal inference
• Research Affiliations: Operations Research Center, Food Supply Chain Analytics and Sensing Initiative

Pharmaceuticals:
• Designing an analytical framework for drug adverse events monitoring, prediction and causal analysis in collaboration with Takeda

Public Health:
• Created a supply chain epidemiology model to understand and prevent zoonotic viruses outbreaks from food supply chains
• Developed a machine-learning algorithm to predict infectious SARS-CoV-2 variants 1 week after their first detection with 86% AUC based on 9.5M+ publicly reported genetic sequences

Health Systems:
• Formulated data-driven managerial policies for 2000+ long-term care facilities to limit infections as part of MIT COVID Alliance

Cyber Security and Supply Chain:
• Provided the first empirical assessment of the impact of supply-chain structure on data breach cyber risk for 15k+ companies

Government Operations and Service Platforms:
• Evaluated government transparency impact on civic engagement through service platforms with a novel 2 stage causal regression

INDUSTRY EXPERIENCE

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY Boston, MA
Data Science Intern, The Ride Summer 2020
• Invented driver behavior metrics and global score achieving 71% bi-weekly consistency based on 300M GPS and 10M trip records
• Built a new scheduling algorithm for para-transit transportation based on time-series and a predictive-prescriptive framework

INTERNACIONAL CLINIC PERU Cambridge, MA
Analytics-Lab Team Member Fall 2019
• Partnered with physicians and data scientists to define key predictive medical features for patients length of stay in the hospital
• Reduced patients wait time to access the hospital by 20% by automating length of stay estimation and bedroom allocation process

ROTHSCHILD & CO Paris, France
Merger & Acquisition Intern, Global Financial Advisory Spring 2019
- Interviewed investment teams, analyzed market data (Bloomberg, FactSet), and structured the financing plan of an $80M deal
- Drove +5% stock price increase of a public retail company by organizing its Investor Day and composing its 5-years strategic plan

BNP PARIBAS Paris, France
Data Science Intern, Corporate and Institutional Banking Summer 2018
- Optimized risk exposures to external counter-parties default with a network flow model in Python reducing risk exposure by 8%
- Inspected various stress tests with different financial scenarios after the $8bn risk exposure of Turkey's 2018 economic crisis

TEACHING EXPERIENCE

MASSACHUSETTS INSTITUTE OF TECHNOLOGY Cambridge, MA
Teaching Assistant 2020-Present
- 15.734 Operations Management, Executive MBA (Summer 2022)
- 15.S51 Innovation Through Analytics and Sensing in Food and Agriculture Systems, Executive MBA (Spring 2022)
- 15.S23 Innovating For Impact, Executive MBA (Summer 2021)

Tutor 2021-Present
- 15.095 Machine Learning under a Modern Optimization Lens, Masters and PhD (Fall 2021)
- 6.215 Optimization Methods, Masters and PhD (Fall 2021)

LYCÉE BLAISE-PASCAL Paris, France
Teaching Assistant 2017-2019
- Teaching Assistant and oral examiner in advanced mathematics for undergraduate students majoring in mathematics and physics

APPRENTIS D'AUTEUIL Paris, France
Instructor, Non-Profit Fall 2016
- Taught mathematics to 30 young asylum-seeker students, and organized awareness campaigns with 25+ education professionals

PAPERS

Public Health:
- Transmission Interaction Persistence (TIP): A Supply Chain and Epidemiological Model for Zoonotic Diseases Outbreaks *(With Retsef Levi, Nicholas Renegar, Lu Chen, Jennifer Gao ; To be submitted)*
- Predicting the Spread of SARS-CoV-2 Variants: An AI-Enabled Early Detection *(With Retsef Levi ; To be submitted)*
- Multi-Wave Respiratory Viruses Infections: The Role of Variants Dynamics *(With Retsef Levi, Yanzhe Ma, Jennifer Gao ; Working paper)*

Health Systems:
- Predicting coronavirus disease 2019 infection risk and related risk drivers in nursing homes: A machine learning approach *(With C.L. Sun, E. Zuccarelli, J, Lee, J. Muller, K. Scott, A. Lujan, Retsef Levi ; Journal of the American Medical Directors Association)*

Cyber Security and Supply Chain:
- Supply Chain Characteristics as Predictors of Cyber Risk: A Machine-Learning Assessment *(With Kevin Hu, Raphael Yahalom, Retsef Levi ; To be submitted)*

Government Operations and Service Platforms:
- Differentiated Impact of Government Transparency on Civic Engagement through Service Platforms and Design Implications *(With Y. Karen Zheng, Jennifer Gao, Retsef Levi ; Working paper)*

SELECTED TALKS

- Transmission Interaction Persistence (TIP): A Supply Chain and Epidemiological Model for Zoonotic Diseases Outbreaks
  - INFORMS Session on Supply Chain Analytics 2022
  - INFORMS Session on Food and Agriculture Supply Chain Analytics 2021
- Supply Chain Characteristics as Predictors of Cyber Risk: A Machine-Learning Assessment
  - Charter of Trust Conference Keynote Presentation 2021

- MIT Machine Intelligence for Manufacturing and Operations Forum 2021

SERVICE

MIT OPERATIONS RESEARCH CENTER SEMINAR Cambridge, MA
Seminar Organizer Fall 2022
• Coordinated the Operations Research Seminar with invited speakers: Profs. Mor Armony, Samuel Burer, Rene Caldentey, Rachel Cummings, Santanu Dey, Peter Frazier, Ernest Ryu, Soroush Saghafian, Max Shen, Huseying Topaloglu, Christina Yu

X-AFRIQUE Paris, France
President 2018-2019
• Lead the Africa club of École Polytechnique and organized a 2-days Entrepreneurship Forum with 5 panels, 1200+ participants, and 30+ tech entrepreneurs coming from Ivory Coast, Ghana, Morocco, Nigeria, Rwanda, Senegal, Tunisia

MATH&MAROC Casablanca, Morocco
Co-founder, Non-Profit 2016-2019
• Co-founded Math&Maroc to democratize mathematics in Morocco through conferences, journal publications and training of the national team to the International Mathematics Olympiads

HONORS & AWARDS

- MIT Dean's Fellowship for outstanding academic record, personal achievements and professional promise, 2020
- French-American Chamber of Commerce Foundation fellowship, 2020
- Outstanding Investment Prize for contribution to student life, 2020
- Agency for French Education Abroad fellowship for academic excellence, 2014-2019

ADDITIONAL INFORMATION

- Programming Skills: Python, R, Julia, SQL, Excel, PowerPoint (Expert), VBA, Power BI (Familiar)
- Languages: English, French, Arabic (Fluent), Spanish (Intermediate)
- Interests: energetic half-marathon runner, fervent soccer supporter and cinephile