Émile Esmaili

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EDUCATION

Columbia University   New York, NY
M.A. in Quantitative Methods in the Social Sciences (QMSS)

Sorbonne Université (Pierre et Marie Curie - Paris VI)   Paris, France
BSc. in Mathematics

PSL Research University (Paris-Dauphine)   Paris, France
MSc. in Financial Engineering - BSc. in Economics

RESEARCH EXPERIENCE

Columbia University & NASA Goddard Institute for Space Studies   New York, NY
Research Staff   *Jan 2024 - June 2025*

- Research staff at the Center for Climate Systems Research supervised by Prof. Michael Puma. and Dr. Andrew Robertson
- Topic 1: Modeling the impact of climate and conflict on food security in early modern Europe using Bayesian multilevel models, econometric contagion models and machine learning
- Topic 2: Calibration of subseasonal-to-seasonal (S2S) rainfall forecasts and drought index prediction with machine learning

Columbia University & NASA Goddard Institute for Space Studies   New York, NY
Research Intern   *Sep 2022 - Dec 2023*

- Graduate research assistant at NASA GISS and Columbia University's Department of Earth and Environmental Engineering, jointly supervised by Prof. Upmanu Lall and Dr. Michael Puma.
- Topic: Using hierarchical Bayesian models and Hidden Markov Models to explore the driving factors of global migration and develop improved probabilistic projections of bilateral migration flows

Memorial Sloan Kettering Cancer Center & Columbia University   New York, NY
Practicum Data Scientist (Capstone Project)   *Jan 2023 − May 2023*

- Researched drivers of lower grade brain glioma using machine learning and survival models
- Worked on an image segmentation model for IHC staining based on MSK's proprietary DeepLIIF model

CONFERENCE PAPERS

- **Modeling Human Migration with Non-Homogeneous Hidden Markov Models: an Application to Inter-state Mobility in the United States**, Emile Esmaili, Upmanu Lall, Michael J.Puma, Aric Cutuli, Rachata Muneepeerakul. AGU Fall Meeting 2023

- **A Bayesian Hierarchical Framework for Capturing Preference Heterogeneity in Migration Flows**, Aric Cutuli, Upmanu Lall, Michael J. Puma, Emile Esmaili, Rachata Muneepeerakul. AGU Fall Meeting 2023

WORKING PAPERS

- **Violent Warfare Ignited Price Contagion Dynamics in Early Modern Europe, Emile Esmaili**, Michael Puma, Francis Ludlow, Eva Jobbova, arXiv:2411.18978

- **Compounding Effects of Harsh Climate and Societal Disruptions on Food Prices in Early Modern Europe**, Emile Esmaili, Michael Puma, Francis Ludlow, Eva Jobbova

Teaching Experience

Columbia University   New York, NY
Teaching Assistant - Machine Learning for the Social Sciences (GR5073)   *Sep 2024 – Dec 2024*
- Held weekly recitations and office hours covering the basics of applied machine learning

Columbia University   New York, NY
Instructor - QMSS Math Camp   *Sep 2024*
- In charge of the refresher session on single and multivariable calculus for first-year QMSS students

Columbia University   New York, NY
Teaching Assistant - Projects in Advanced Machine Learning (GR5074)   *Jan 2023 – May 2023*
- Held weekly recitations and office hours covering the basics of applied deep learning

Work Experience

Ekimetrics   Paris, France
Data Scientist   *Sep 2021 – May 2022*
- Worked on Natural Language Processing (NLP) applications in the financial sector

Skills

Software: Python, MATLAB, R, Git, LaTeX

Natural Languages: French (Native), Farsi (Native), English (Professional), German (Elementary)