

ARIC CUTULI

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EDUCATION

Columbia University

M.S. Financial Engineering

Sep 2022 - Dec 2023

New York, NY

University of California, Los Angeles

B.S. Mathematics/Economics, Specialization in Computing

Sep 2019 - Jun 2022

Los Angeles, CA

RESEARCH INTERESTS

- Uncertainty quantification
- Probabilistic programming
- Reinforcement learning
- Behavioral finance
- Bayesian nonparametrics
- Causal machine learning
- Game theory
- Market microstructure

RESEARCH EXPERIENCE

Research Assistant

Columbia University, Center for Climate Systems Research at NASA GISS

Feb 2023 – Present

New York, NY

- Probabilistic modeling of human migration flows
- Supervisors: Upmanu Lall, Michael J. Puma

PROFESSIONAL EXPERIENCE

Quantitative Summer Analyst, Equities Central Risk

Citigroup

Jun 2023 – Aug 2023

New York, NY

- Calibration and uncertainty quantification of systematic order filtering strategies using alternative data

Quantitative Summer Analyst, Data Science

Citigroup

Jun 2022 – Aug 2022

New York, NY

- Language model fine-tuning for news classification

Quantitative Developer

Consulting Startup

Dec 2021 – May 2022

Remote

- Derivative pricing and risk management tools for trading bots

Data Analyst Intern

Edelman Financial Engines

Jun 2021 – Aug 2021

Santa Clara, CA

- Identification of fiduciary performance issues through statistical testing

RESEARCH PAPERS

Conference papers

1. A Bayesian Hierarchical Framework for Modeling Migration Flows. **Aric Cutuli**, Upmanu Lall, Michael J. Puma, Emile Esmaili, Rachata Muneeppeerakul. (2023). In *American Geophysical Union Annual Meeting AGU23*.
2. Modeling Migration Flows with Non-Homogeneous Hidden Markov Models. Emile Esmaili, Upmanu Lall, Michael J. Puma, **Aric Cutuli**, Rachata Muneeppeerakul. (2023). In *American Geophysical Union Annual Meeting AGU23*.

Technical Reports

- Separation Capacity of Randomly Initialized Deep Neural Networks. **Aric Cutuli**, Harold Haodong Miao, Weitao Zhu. (2023). Columbia University, EECS 6699: Mathematics of Deep Learning.

Personal Projects & Blog Articles

Hawkes Processes and Time Clustering in Finance

May 2023 – Jun 2023

- Brief article discussing maximum likelihood procedure for calibrating Hawkes processes

Trading in the Limit Order Book with CNN-LSTM

Jan 2022 – Jul 2022

- Replication of a paper using deep learning, prediction sampling, and Shannon entropy to extract order flow information from the limit order book and forecast directional moves

Portfolio Allocation Across Global Equity Exchanges

Aug 2021

- Exploratory article identifying a few global equity indices as producers of a historically mean-variance optimal portfolio

INVITED TALKS

- A Bayesian Hierarchical Framework for Modeling Migration Flows.
American Geophysical Union Annual Meeting AGU23, San Francisco, CA, December 2023. (Poster)
MURI Migration 2023 Annual Evaluation, Virtual, August 2023. (15 min)
- A Survey of Hawkes Processes in Finance.
Directed Reading Program Student Colloquium, University of California, Los Angeles, January 2022. (15 min)

TEACHING EXPERIENCE

Teaching Assistant

Columbia University, School of Engineering and Applied Sciences

- IEOR 4733 - Algorithmic Trading, Spring 2023

GRANTS, SCHOLARSHIPS, & AWARDS

University Grant, <i>University of California, Los Angeles</i>	\$ 40,000
Legacy Scholar, <i>Elks National Foundation</i>	\$ 4,000
IAHF Scholar, <i>Italian American Heritage Foundation</i>	\$ 1,000
Most Valuable Student Scholar, <i>CA-Hawaii Elks Foundation</i>	\$ 200

COURSEWORK

** *doctorate course*

* *graduate course*

<ul style="list-style-type: none">• Continuous-time RL **• Bayesian models in ML **• Computational stochastic modeling **• Math of deep learning **	<ul style="list-style-type: none">• Reinforcement learning *• Time series & statistics *• Optimization *• Sampling & Monte Carlo simulations *	<ul style="list-style-type: none">• Stochastic calculus *• Stochastic processes *• Object-oriented programming *• Trading systems *	<ul style="list-style-type: none">• Linear algebra• Algorithms• Econometrics• Real analysis• Numerical analysis
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PROGRAMMING SKILLS

<ul style="list-style-type: none">• Python• C++• q/kdb+	<ul style="list-style-type: none">• Java• pandas• NumPy	<ul style="list-style-type: none">• scikit-learn• statsmodels• Pyro	<ul style="list-style-type: none">• TensorFlow• PyTorch• JAX
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