ACHRAF BAHAMOU
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EDUCATION

Columbia University, New York, NY 2018 - Present
Ph.D. Candidate in Operations Research, Data Science track. GPA: 4.16/4.0
Master of Science in Operations Research, May 2019.
Advisors: Prof. Donald Goldfarb and Prof. Omar Besbes
Relevant PhD Courses: Machine Learning and High-Dimensional Data, Optimization I and II, Stochastic Modeling I and II, Reinforcement Learning, Theoretical Neuroscience, Quantum Computing.

Ecole Polytechnique, Paris, France 2015 - 2018
Bachelor of Science and Master of Science in Applied Mathematics.
Relevant Courses: Machine learning, Statistics, Times Series Analysis, Stochastic processes and Monte Carlo methods, Optimization, Random modeling, Analysis of Algorithms, Statistical Physics, Quantum Mechanics.

INDUSTRY EXPERIENCE

Jump Trading, Chicago 2022 (June-August)
Quantitative Research Intern
- Research, feature engineering, model selection and writing execution algorithms.

Amazon, Seattle 2021 (May-August)
Applied Scientist Intern
- Research on Data-Driven Pricing using Machine Learning.

Google, New York 2020 (June-August)
Data Scientist Intern
- Worked with Active-Learning-For-All (ALFA) and Neurosurgeon teams, Google Research NYC.
- Research on active learning gains forecasting.

Hellebore Capital Limited, London 2018 (April-July)
Quantitative Research Intern
- Worked on modeling irregularly spaced trades arrival times using multivariate Hawkes processes.
- Built packages to deal with data extraction, preprocessing, fit and simulation of different Hawkes Processes models.

Air France-KLM, Paris 2017 (June-August)
Data Analyst Intern, Revenue Management and Decision Support Team
- Worked on estimating the unconstrained demand on long-haul flights using time series forecasting models and machine learning.

SKILLS AND ACTIVITIES

Languages
- Arabic (native), French (Bilingual), English (full proficiency)

Programming & Tools
- Python(Tensorflow, Pytorch, Numpy, Pandas), Matlab, R, Java, C++

Sports
- Soccer, Motorcycling, Futsal, Tennis.

CITIZENSHIP
- Citizen of Morocco and France
RESEARCH

Practical BFGS Methods for Training Deep Neural Networks. Joint with Donald Goldfarb and Yi Ren. Accepted paper, Spotlight paper, Neurips 2020.

Stochastic Flows and Geometric Optimization on the Orthogonal Group. K. Choromanski et al. Accepted paper, ICML 2020.

Optimal Pricing with a Single Point. joint with Omar Besbes and Amine Allouah. Accepted paper in EC 2021. Major Revision in Management Science.

Revenue Maximization from Finite Samples. joint with Omar Besbes and Amine Allouah. Published in Operations Research. Accepted paper in EC 2021.

A Mini-Block Natural Gradient Method for Deep Neural Networks. joint with Donald Goldfarb and Yi Ren. (Submitted to ICML), 2021.

Kronecker-factored Quasi-Newton Methods for Deep Learning. joint with Donald Goldfarb and Yi Ren. (Submitted to ICML), 2021.

A Layer-wise Adaptive Step-Size Procedure for Stochastic First-Order Optimization Methods. joint with Donald Goldfarb. (Ongoing work), 2021.

Optimal Limited Price Experimentation. joint with Omar Besbes and Amine Allouah. (Ongoing work).

Hawkes processes for credit indices time series analysis: How random are trades arrival times? joint with Maud Doumergue, Philippe Donnat, Hellebore Capital LLC. Accepted paper, ITISE 2018 International Conference on Time Series and Forecasting.

HONORS AND AWARDS

Deming Center Doctoral Fellowship, 2021 Doctoral fellow

MSOM Best Student Paper Competition 2021, Second place

Meta PhD Research Fellowship, 2022 Finalist

Postgraduate Excellence Scholarship (OCP Foundation), 2018 fellow

French Government Major-Excellence Scholarship

Hassan II Academy of Science and Technology Fellowship
First Prize in The National Open Competition Of Science and Technology - Physics category

TEACHING EXPERIENCE

Columbia Center for Teaching and Learning, Research Assistant Spring 2020
Advisor: Yi Zhang. Collaborating with the Center for Teaching and Learning to introduce an auto-grading framework and incorporate digital technology into the teaching environment to facilitate active learning.

Columbia University, Head Teaching Assistant
- Optimization Models and Methods IEORE 4004, Spring 2021, MSOR core course.
- Business Analytics IEOR 4650, Fall 2019, MSBA course.
- Simulation IEOR 4404, Fall 2018, 2020, MSOR core course. IEOR 3404, Spring 2019, 2020.

REFERENCES

Prof. Donald Goldfarb
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Prof. Omar Besbes
Columbia Business School
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Jean-Francois Kagy
Google Research, NYC.
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Yi Zhang
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