

Jason Milionis

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EDUCATION

Columbia University

September 2021 - Present

Doctor of Philosophy (Ph.D.) Candidate in Computer Science

Master of Philosophy (M.Phil.) in Computer Science (awarded May 2024)

Master of Science (M.S.) in Computer Science (awarded May 2022)

New York, NY

- Working with the [CS Theory Group](#)
- Ph.D. Advisors: Prof. Christos Papadimitriou & Prof. Tim Roughgarden. GPA: 4.0/4.0

National Technical University of Athens (NTUA)

September 2016 - June 2021

Master of Engineering (M.Eng.): Joint degree in Electrical & Computer Engineering

Athens, Greece

- 1st in class, GPA: 10.00/10.00
- Thesis: “Regression with unbounded covariates under differentially private learning constraints”
- Thesis Advisor: Prof. Dimitris Fotakis, CoReLab (Computation & Reasoning Laboratory)

CONFERENCE & JOURNAL PUBLICATIONS

Swim till you sink: Computing the limit of a game

SAGT 2024

- with Rashida Hakim, Christos Papadimitriou, Georgios Piliouras
- **Best Paper** award of the conference

A Myersonian Framework for Optimal Liquidity Provision in Automated Market Makers

ITCS 2024

- with Ciamac C. Moallemi, Tim Roughgarden

An impossibility theorem in game dynamics

PNAS 2023

- Proceedings of the National Academy of Sciences of the United States of America, volume 120, no. 41
- with Christos Papadimitriou, Kelly Spendlove, Georgios Piliouras

Automated Market Making and Arbitrage Profits in the Presence of Fees

FC 2024, FC DeFi 2023 (abstract)

- with Ciamac C. Moallemi, Tim Roughgarden

Complexity-Approximation Trade-offs in Exchange Mechanisms: AMMs vs. LOBs

FC 2023

- with Ciamac C. Moallemi, Tim Roughgarden

Automated Market Making and Loss-Versus-Rebalancing

ACM CCS DeFi 2022

- with Ciamac C. Moallemi, Tim Roughgarden, Anthony Lee Zhang
- Informed AMM design and ignited follow-up on approaches for mitigating Loss-Versus-Rebalancing (LVR)
- Invited poster presentation at the Data Science Institute (DSI) [Financial and Business Analytics Center](#)
- Selected for inclusion in the DSI Data Science Day 2024 poster and demo session

A Framework for Single-Item NFT Auction Mechanism Design

ACM CCS DeFi 2022

- with Dean Hirsch, Andy Ardit, Pranav Garimidi
- Selected for the Association for Computing Machinery (ACM) Showcase, to further the outreach beyond academics

Nash, Conley, and Computation: Impossibility and Incompleteness in Game Dynamics

SAGT 2022

- with Christos Papadimitriou, Georgios Piliouras, Kelly Spendlove

Differentially Private Regression with Unbounded Covariates

AISTATS 2022

- with Alkis Kalavasis, Dimitris Fotakis, Stratis Ioannidis

PROFESSIONAL & ADVISORY EXPERIENCE

Research Intern, Crypto

June 2024 - August 2024

Andreessen Horowitz Capital Management (a16z)

New York, NY

- Ph.D. research internship on market design

Crypto Researcher Intern <i>Jump Trading</i>	June 2023 - August 2023 New York, NY
<ul style="list-style-type: none"> • Ph.D. research internship looking into transaction fee structures and price discovery on AMMs 	
Technical AI Safety Fellow <i>Columbia AI Alignment Club (CAIAC), Columbia Effective Altruism (CUEA)</i>	July 2023 - August 2023 New York, NY
<ul style="list-style-type: none"> • Selected as a Fellow by the Columbia AI Alignment Club 	
Research Fellow <i>Uniswap Labs</i>	January 2023 - May 2023 New York, NY
<ul style="list-style-type: none"> • Conducted applied research on the competitiveness of liquidity providers in automated market makers • Worked with Austin Adams, Xin Wan 	
Research Intern <i>Archimedes Research Center</i>	June 2022 - August 2022 Athens, Greece
<ul style="list-style-type: none"> • Ph.D. research internship at the summer AI intern program, working on the group of Optimization Theory. 	
Uniswap Lead, Blockchain@Columbia <i>Governance Protocol Leader</i>	May 2022 - December 2022 New York, NY
<ul style="list-style-type: none"> • Advisor on Uniswap Governance Proposals • Posted technical opinions that helped shape decisions in the Uniswap Governance community (example) • Mentored members on technical, societal aspects of governance, and treasury allocation for grant funding • Interviewed candidates for board membership at the Blockchain Club, and planned board meeting agendas 	
Affiliate, Center for Digital Finance and Technologies <i>School of Engineering and Applied Sciences, Columbia University</i>	September 2022 - Present New York, NY
<ul style="list-style-type: none"> • Inaugural affiliate of the Center, invited by the Center Director, Prof. Agostino Capponi • The Center leverages multi-disciplinary expertise at Columbia to advance the digital transformation of financial services for higher efficiency and security, increased accessibility, and greater social responsibility 	

RESEARCH TALKS, INTERVIEWS & INVITATIONS

FinsureTech Conference 2024 <i>The economics of decentralized exchanges and LVR (loss-versus-rebalancing)</i>	July 1, 2024 Zurich
Ninth Marketplace Innovation Workshop (MIW 2024) <i>A Myersonian Framework for Optimal Liquidity Provision in Automated Market Makers</i>	May 21, 2024 Online
Carnegie Mellon University (CMU) Secure Blockchain Summit <i>LVR (loss-versus-rebalancing) and the economics of decentralized exchanges</i>	April 16, 2024 Pittsburgh, PA
Cornell University Theory Tea <i>Modern auction design considerations: on auctioneer and inter-bidder incentives</i>	April 10, 2024 Ithaca, NY
Twenty-Eighth International Conference on Financial Cryptography and Data Security (FC 2024) <i>Automated Market Making and Arbitrage Profits in the Presence of Fees</i>	March 4, 2024 Curaçao
Econ-DeFi Seminar, Department of Economics, UC Santa Barbara <i>The Effect of Trading Fees on Arbitrage Profits in Automated Market Makers</i>	March 1, 2024 Online
15th Innovations in Theoretical Computer Science Conference (ITCS 2024) <i>A Myersonian Framework for Optimal Liquidity Provision in Automated Market Makers</i>	February 1, 2024 Berkeley, CA
Mathematical Finance Seminar Series, Department of Statistics, Columbia University <i>Quantifying Loss in Automated Market Makers (Loss-Versus-Rebalancing/LVR)</i>	November 30, 2023 New York, NY
Constantinos Daskalakis research group meeting, Department of EECS, MIT <i>What do game dynamics uncover about the meaning of the game?</i>	November 22, 2023 Boston, MA
Interviewed at the Bell Curve Podcast <i>The LP Profitability Problem: LVR, Dynamic Fees and Auctions</i>	October 3, 2023 New York, NY
The Science of Blockchain Conference 2023, Stanford University <i>Automated Market Making and Arbitrage Profits in the Presence of Fees</i>	August 28, 2023 Palo Alto, CA

Workshop on Decentralized Finance (DeFi), Twenty-Seventh International Conference on Financial Cryptography and Data Security (FC 2023) <i>How Do Trading Fees Affect Arbitrage Profits?</i>	May 5, 2023 Brač, Croatia
Twenty-Seventh International Conference on Financial Cryptography and Data Security (FC 2023) <i>Complexity-Approximation Trade-offs in Exchange Mechanisms: AMMs vs. LOBs</i>	May 1, 2023 Brač, Croatia
ACM Conference on Computer and Communications Security (CCS) Workshop on Decentralized Finance and Security 2022 <i>Quantifying Loss in Automated Market Makers</i>	November 11, 2022 Los Angeles, CA
ACM Conference on Computer and Communications Security (CCS) Workshop on Decentralized Finance and Security 2022 <i>A Framework for Single-Item NFT Auction Mechanism Design</i>	November 11, 2022 Los Angeles, CA
Carnegie Mellon University (CMU) Security and Privacy Institute (CyLab) Crypto Seminar Series <i>Automated Market Making and Loss-Versus-Rebalancing (LVR)</i>	October 27, 2022 Pittsburgh, PA
Panelist at the CBER (Crypto and Blockchain Economics Research Forum) Symposium <i>Decentralized Exchanges</i>	October 20, 2022 Online
15th International Symposium on Algorithmic Game Theory (SAGT) 2022 <i>Nash, Conley, and Computation: Impossibility and Incompleteness in Game Dynamics</i>	September 14, 2022 Colchester, UK
The 25th International Conference on Artificial Intelligence and Statistics (AISTATS 2022) <i>Differentially Private Regression with Unbounded Covariates (poster presentation)</i>	March 30, 2022 Online
Simons Institute for the Theory of Computing, University of California Berkeley (UCB) <i>Dynamical Systems, Games, and Topology: a relationship in formation</i>	March 8, 2022 Berkeley, CA
Columbia CS Theory Student Seminar <i>Dynamical Systems, Games, and Topology: an introduction</i>	New York, NY February 24, 2022

HONORS & AWARDS

Onassis Foundation Scholarship	September 2024 - 2025
Two Sigma PhD Fellowship, 2nd Place	March 2024
Columbia CS Department Service Award In recognition of superior achievement and in honor of the integrity, curiosity, and creativity exhibited	May 2022
General Michael Arnaoutis Foundation Scholarship Scholarship for post-graduate studies, cash prize	May 2021
Excellence Award (State Scholarships Foundation & Ministry of Education) For graduating 1st in the class of 2021 among all graduating students of the ECE School at NTUA	July 2022
Chrisovergi and Kondouli Honorary Awards Awarded by NTUA Dean's Council for graduating 1st in class among all students of the Department of ECE and across all Departments of NTUA, respectively	March 2022
Kary Honorary Award Medal accompanying the award, awarded by the NTUA Dean's Council for the highest GPA among all classes of the ECE School at NTUA	2016-2017, 2017-2018, 2018-2019, 2019-2020
Thomaidio Honorary Award First Award by the NTUA Dean's Council for the highest GPA among all classes across NTUA Departments	2016-2017, 2017-2018, 2018-2019, 2019-2020
Silver Medal (2018) and Bronze Medal (2017) in SEEMOUS representing Greece (South Eastern European Mathematical Olympiad for University Students)	2017, 2018 North Macedonia & Romania
Christos Papakyriakopoulos Honorary Award and Nikolaos Kritikos Scholarship For the best academic performance and excellence in Mathematics during the first year of studies at NTUA	2016-2017

ACADEMIC SERVICE

Program Committee (PC) Member

- International Conference on Advances in Financial Technologies (AFT 2024)
- Workshop on Scalability & Interoperability of Blockchains (SIB 2024)
- The Latest in DeFi Research Conference (TLDR 2024)
- Workshop on Decentralized Finance (DeFi), Twenty-Eighth International Conference on Financial Cryptography and Data Security (FC 2024)
- International Conference on Advances in Financial Technologies (AFT 2023)
- Workshop on Decentralized Finance (DeFi), Twenty-Seventh International Conference on Financial Cryptography and Data Security (FC 2023)

Reviewer

- 38th Annual Conference on Neural Information Processing Systems (NeurIPS 2024)
- 2024 JPE Micro (Journal of Political Economy Microeconomics)
- 2024 Finance & Stochastics journal
- 2024 AIMS (American Institute of Mathematical Sciences) Frontiers of Mathematical Finance journal
- 2024 Journal of Economic Dynamics and Control (JEDC)
- 15th Innovations in Theoretical Computer Science Conference (ITCS 2024)
- 2024 ACM-SIAM (Association for Computing Machinery - Society for Industrial and Applied Mathematics) Symposium on Discrete Algorithms (SODA 2024)
- 2023 Special Issue on The Microstructure of Decentralized Finance, Applied Mathematical Finance journal
- 2023 ACM Distributed Ledger Technologies: Research and Practice (DLT) journal
- 50th EATCS (European Association for Theoretical Computer Science) International Colloquium on Automata, Languages and Programming (ICALP 2023)

DEPARTMENT SERVICE

- Coordinator, Columbia CS Theory Student Seminar** Fall 2022, Spring 2023, Fall 2023, Spring 2024
- Organized research talks to be given by Ph.D. students at the Columbia CS theory student weekly seminar
- Mentor, Women in Science at Columbia (WISC)** Fall 2023
- Mentored advanced undergraduates of diverse gender identities to prepare for their future career
- Mentor, Columbia Undergraduate Seminar in Theoretical Computer Science** Spring 2023
- Lectured on recent prediction markets research (game theory, economics and computer science)
 - Advised a group of advanced undergraduate students in theoretical computer science on their presentations for the student-run seminar on computer science
- Reviewer, Columbia CS PhD Pre-Submission Application Review (PAR) Program** Fall 2022
- Volunteer reviewer of application materials from under-represented groups to promote diversity and equity

TEACHING EXPERIENCE

- Head Teaching Assistant (TA), “Analysis of Algorithms” (CSOR 4231)** Spring 2024
- Developed and graded problem sets, and semester project, held office hours and review sessions
- Graduate Teaching Assistant (TA), “Reading the CS Classics” (COMS 6998)** Spring 2023
- Organized research paper discussions and assignments, graded students’ paper presentations, and evaluated students’ final research papers
 - Ph.D.-level course (Topics in Computer Science, COMS 6998) taught by Prof. Christos Papadimitriou
- TA, “Cryptography”** Fall 2020
- Created problem sets, held office hours, graded students’ homework assignments and final research projects in this graduate-level course
 - Lectured on blockchain consensus-related topics
- TA, “Introduction to Programming” & “Programming Techniques”** Fall & Spring 2017-2020
- Assisted students with the laboratory exercises for the courses, and prepared course materials for teaching C & C++

VOLUNTEERING

- Vice-Chair, IEEE NTUA Student Branch** October 2018 - January 2020

- Arranged technical talks by distinguished technological companies' guests, met with Dean to discuss future plans and funding of the branch, and managed yearly competitive programming contest
- While in office, our Branch was awarded the **IEEE Region 8 Exemplary Student Branch Award**.

Programming Experience & Analytical Skills: Python, C++, Matlab, Wolfram Mathematica, SQL