

# Jason Milionis

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## EDUCATION

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### 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

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### [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 DeFi 2023 (abstract), FC 2024

- 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

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### Crypto Researcher Intern

June 2023 - August 2023

*Jump Operations*

*New York, NY*

- Ph.D. research internship

### Research Fellow

January 2023 - May 2023

*Uniswap Labs*

*New York, NY*

- Conducted applied research on the competitiveness of liquidity providers in automated market makers
- Worked with Austin Adams, Xin Wan

<b>Technical AI Safety Fellow</b> <i>Columbia AI Alignment Club (CAIAC), Columbia Effective Altruism (CUEA)</i> <ul style="list-style-type: none"> <li>Selected as a Fellow by the Columbia AI Alignment Club</li> </ul>	July 2023 - August 2023 New York, NY
<b>Research Intern</b> <i>Archimedes Research Center</i> <ul style="list-style-type: none"> <li>Ph.D. research internship at the summer AI intern program, working on the group of Optimization Theory.</li> </ul>	June 2022 - August 2022 Athens, Greece
<b>Uniswap Lead, Blockchain@Columbia</b> <i>Governance Protocol Leader</i> <ul style="list-style-type: none"> <li><b>Advisor</b> on Uniswap Governance Proposals</li> <li>Posted technical opinions that helped shape decisions in the Uniswap Governance community (<a href="#">example</a>)</li> <li>Mentored members on technical, societal aspects of governance, and treasury allocation for grant funding</li> <li>Interviewed candidates for board membership at the Blockchain Club, and planned board meeting agendas</li> </ul>	May 2022 - December 2022 New York, NY
<b>Affiliate, Center for Digital Finance and Technologies</b> <i>School of Engineering and Applied Sciences, Columbia University</i> <ul style="list-style-type: none"> <li>Inaugural affiliate of the Center, invited by the Center Director, Prof. Agostino Capponi</li> <li>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</li> </ul>	September 2022 - Present New York, NY

## RESEARCH TALKS, INTERVIEWS & INVITATIONS

<b>Carnegie Mellon University (CMU) Secure Blockchain Summit</b> <i>LVR (loss-versus-rebalancing) and the economics of decentralized exchanges</i>	April 16, 2024 Pittsburgh, PA
<b>Cornell University Theory Tea</b> <i>Modern auction design considerations: on auctioneer and inter-bidder incentives</i>	April 10, 2024 Ithaca, NY
<b>Twenty-Eighth International Conference on Financial Cryptography and Data Security (FC 2024)</b> <i>Automated Market Making and Arbitrage Profits in the Presence of Fees</i>	March 4, 2024 Curaçao
<b>Econ-DeFi Seminar, Department of Economics, UC Santa Barbara</b> <i>The Effect of Trading Fees on Arbitrage Profits in Automated Market Makers</i>	March 1, 2024 Online
<b>15th Innovations in Theoretical Computer Science Conference (ITCS 2024)</b> <i>A Myersonian Framework for Optimal Liquidity Provision in Automated Market Makers</i>	February 1, 2024 Berkeley, CA
<b>Mathematical Finance Seminar Series, Department of Statistics, Columbia University</b> <i>Quantifying Loss in Automated Market Makers (Loss-Versus-Rebalancing/LVR)</i>	November 30, 2023 New York, NY
<b>Constantinos Daskalakis research group meeting, Department of EECS, MIT</b> <i>What do game dynamics uncover about the meaning of the game?</i>	November 22, 2023 Boston, MA
<b>Interviewed at the Bell Curve Podcast</b> <i>The LP Profitability Problem: LVR, Dynamic Fees and Auctions</i>	October 3, 2023 New York, NY
<b>The Science of Blockchain Conference 2023, Stanford University</b> <i>Automated Market Making and Arbitrage Profits in the Presence of Fees</i>	August 28, 2023 Palo Alto, CA
<b>Workshop on Decentralized Finance (DeFi), Twenty-Seventh International Conference on Financial Cryptography and Data Security (FC 2023)</b> <i>How Do Trading Fees Affect Arbitrage Profits?</i>	May 5, 2023 Brač, Croatia
<b>Twenty-Seventh International Conference on Financial Cryptography and Data Security (FC 2023)</b> <i>Complexity-Approximation Trade-offs in Exchange Mechanisms: AMMs vs. LOBs</i>	May 1, 2023 Brač, Croatia
<b>ACM Conference on Computer and Communications Security (CCS)</b> <b>Workshop on Decentralized Finance and Security 2022</b> <i>Quantifying Loss in Automated Market Makers</i>	November 11, 2022 Los Angeles, CA
<b>ACM Conference on Computer and Communications Security (CCS)</b> <b>Workshop on Decentralized Finance and Security 2022</b> <i>A Framework for Single-Item NFT Auction Mechanism Design</i>	November 11, 2022 Los Angeles, CA

<b>Carnegie Mellon University (CMU) Security and Privacy Institute (CyLab)</b> <b>Crypto Seminar Series</b> <i>Automated Market Making and Loss-Versus-Rebalancing (LVR)</i>	October 27, 2022 <i>Pittsburgh, PA</i>
<b>Panelist at the CBER (Crypto and Blockchain Economics Research Forum) Symposium</b> <i>Decentralized Exchanges</i>	October 20, 2022 <i>Online</i>
<b>15th International Symposium on Algorithmic Game Theory (SAGT) 2022</b> <i>Nash, Conley, and Computation: Impossibility and Incompleteness in Game Dynamics</i>	September 14, 2022 <i>Colchester, UK</i>
<b>The 25th International Conference on Artificial Intelligence and Statistics (AISTATS 2022)</b> <i>Differentially Private Regression with Unbounded Covariates (poster presentation)</i>	March 30, 2022 <i>Online</i>
<b>Simons Institute for the Theory of Computing, University of California Berkeley (UCB)</b> <i>Dynamical Systems, Games, and Topology: a relationship in formation</i>	March 8, 2022 <i>Berkeley, CA</i>
<b>Columbia CS Theory Student Seminar</b> <i>Dynamical Systems, Games, and Topology: an introduction</i>	<i>New York, NY</i> February 24, 2022

## HONORS & AWARDS

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<b>Columbia CS Department Service Award</b> In recognition of superior achievement and in honor of the integrity, curiosity, and creativity exhibited	May 2022
<b>General Michael Arnaoutis Foundation Scholarship</b> Scholarship for post-graduate studies, cash prize	May 2021
<b>Excellence Award (State Scholarships Foundation &amp; Ministry of Education)</b> For graduating 1st in the class of 2021 among all graduating students of the ECE School at NTUA	July 2022
<b>Chrisovergi and Kondouli Honorary Awards</b> Awarded by NTUA Dean's Council for graduating 1st in class among all students of the Department of ECE and <b>across all Departments</b> of NTUA, respectively	March 2022
<b>Kary Honorary Award</b> 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
<b>Thomaidio Honorary Award</b> 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
<b>Silver Medal (2018) and Bronze Medal (2017) in SEEMOUS</b> representing Greece (South Eastern European Mathematical Olympiad for University Students)	2017, 2018 <i>North Macedonia &amp; Romania</i>
<b>Christos Papakyriakopoulos Honorary Award and Nikolaos Kritikos Scholarship</b> For the best academic performance and excellence in Mathematics during the first year of studies at NTUA	2016-2017

## ACADEMIC SERVICE

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### Program Committee (PC) Member

- International Conference on Advances in Financial Technologies (AFT 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

- 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

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- 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

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- 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

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- 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