# Marios Papachristou

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Areas

Algorithms, Information Networks, Machine Learning, Data Mining

EDUCATION

## **Cornell University**

2020 - exp. 2026

Ph.D. in Computer Science, Minor: Applied Mathematics

- Advisor: Jon Kleinberg
- Relevant Coursework: Analysis of Algorithms, Information Networks, Numerical Methods for Data Science, Design of Online Marketplaces, ML Theory

M.S. in Computer Science

2020 - 2022

## National Technical University of Athens

2015 - 2020

Diploma in Electrical and Computer Engineering (top~2%). Major: Computer Science.

- Advisor: Dimitris Fotakis

REFEREED PUBLICATIONS Google Scholar Profile  $\alpha\beta$  = alphabetical order \* = equal contribution

- [P1] Marios Papachristou, Sid Banerjee, Jon Kleinberg. "Dynamic Interventions for Networked Contagions". ACM Web Conference (WWW) 2023.

  [preprint] [code] [poster] [paper] [slides]
- [P2] Marios Papachristou, Jon Kleinberg. "Core-periphery Models for Hypergraphs".

  ACM SIGKDD Intl. Conf. on Knowledge Discovery and Data Mining (KDD)

  2022.

  [paper] [code] [data] [slides] [poster]
- [P3] Marios Papachristou, Jon Kleinberg. "Allocating Stimulus Checks in Times of Crisis". ACM Web Conference (WWW) 2022.

  [preprint] [code] [paper] [talk] [slides] [news]
- [P4] Marios Papachristou. "Sublinear Domination and Core-periphery Networks". Scientific Reports (Nature), 2021.

  [paper] [code]
- [P5]  $^{\alpha\beta}$  Apostolos Chalkis, Vissarion Fisikopoulos, Marios Papachristou, Elias Tsigaridas. "Truncated Log-concave Sampling for Convex Bodies with Reflective Hamiltonian Monte Carlo". ACM Transactions on Mathematical Software (TOMS), 2023. This paper incorporates and supersedes our previous preprint. [paper] [code]
- [P6] Marios Papachristou. "Software clusterings with vector semantics and the call graph". ACM Joint Meeting on European Software Engineering Conference and Symposium on the Foundations of Software Engineering (ESEC/FSE) 2019.

  [paper] [code] [data] (ESEC/FSE Student Research Competition Finalist Paper)
- [P7] Vasilis Kostakis\*, and <u>Marios Papachristou</u>\*. "Commons-based peer production and digital fabrication: The case of a RepRap-based, Lego-built 3D printing-milling machine". *Telematics and Informatics*, 2014.

  [paper]

WORKING PAPERS

[W1] Marios Papachristou, Sid Banerjee, Jon Kleinberg. "Optimal Resource Allocation for Remediating Networked Contagions". R&R in Management Science. 2023.

- This paper extends our previous works in WWW 2022 and WWW 2023. [slides]
- [W2] Marios Papachristou, Longqi Yang, Chin-Chia Hsu, "Leveraging Large Language Models for Collective Decision-Making". Under review. 2023. [preprint]
- [W3] Marios Papachristou, Amin Rahimian. "Group Decision-Making among Privacy-aware Agents". *Under review.* 2023.
- [W4] Marios Papachristou, Amin Rahimian. "Differentially Private Distributed Estimation and Learning". *Under review.* 2023.

  [preprint] [code]
- [W5] Marios Papachristou, Amin Rahimian. "Production Networks Resilience: Cascading Failures, Power Laws and Optimal Interventions". Under review. Preliminary poster presented at the ACM Conference of Economics and Computation (EC). 2023.
  [preprint] [code] [slides]
- [W6] Marios Papachristou, Rishab Goel, Frank Portman, Matt Miller, Rong Jin. "GLINKX: A Scalable Unified Framework for Homophilous and Heterophilous Graphs". Under Review. 2023 Preliminary version presented at NeurIPS workshop on Graph Learning Frontiers (GLFrontriers), 2022. [preprint] [poster] [workshop]
- [W7] Marios Papachristou, Dimitris Fotakis. "Stochastic Opinion Dynamics for User Interest Prediction in Online Social Networks". Preprint, 2020. [preprint]

RESEARCH EXPERIENCE

#### Applied Research Intern – Microsoft

May 2023 - August 2023

- Large Language Models (LLMs) for collective intelligence.
- Office of Applied Research, with Chin-Chia Hsu and Longqi Yang

#### **Engineering Intern – Twitter**

May 2022 - August 2022

- Scalable Graph Machine Learning on graphs.
- User Modeling Research, with Rishab Goel, Frank Portman, and Matthew Miller

## Graduate Researcher - Cornell University

Sept. 2020 - ongoing

 Research in social and information networks, (allocation algorithms to mitigate contagion in financial and supply-chain networks, statistical graph and hypergraph models)

#### Researcher – GeomScale Organization

May 2020 - March 2020

- Part-time research on sampling from truncated log-concave densities, and convex optimization, working on the volesti open-source package.
- Mentors: Apostolos Chalkis, Vissarion Fisikopoulos, Elias Tsigaridas

#### Researcher – Athens University of Economics and Business 2018 – 2020

- Software architecture recovery via call graphs, source code embeddings, and clustering methods.
- Mentor: Diomidis Spinellis

## Google Summer of Code 2020 (GeomScale)

June 2020 - August 2020

Project: Sampling from high-dimensional truncated log-concave densities.
 [code] [talk1] [talk2]

# Google Summer of Code 2018 (GFOSS-OTA) April 2018–September 2018

- Project: 3gm. Automated codification of Greek Legislation.

# [code] [data] [talk]

	Researcher – P2P Lab	2013 - 2014	
Honors &	- Onassis Scholarship	2023	
Awards	<ul> <li>LinkedIn Ph.D. Fellowship (14.8% acceptance rate)</li> </ul>	2022	
	- Gerondelis Scholarship	2022	
	<ul> <li>A.G. Leventis Scholarship (12.5% acceptance rate)</li> </ul>	2022	
	- Chateaubriand Fellowship (declined)	2022	
	- Cornell Fellowship	2020	
	- Thomaidion Award	2019	
	– ESEC/FSE 2019 ACM Student Research Competition Fi	nalist 2019	
	- 4th (out of 93) in International Space Engineering Compe	etition (CanSat) 2013	
	- 2nd Award at the "be finnovative 2.0 accelerator"	2018	
	- 1st Award at "Crowdhackathon Fintech #2"	2017	
	– Top %1 worldwide in IEEEXtreme 11.0 Programming Co	empetition 2017	
	– Touramanoglu Scholarship	2018	
	– "The Great Moment of Education" Scholarship	2015	
Teaching	- The Structure of Information Networks (PhD-level, Corne	ell) Spring & Fall 2023	
Experience	- Discrete Mathematics (NTUA)	Spring 2017	
	<ul> <li>Programming Techniques (NTUA)</li> </ul>	Spring 2016	
	– Introduction to Computer Programming (NTUA)	Fall 2016, Fall 2017	
Talks & Presentations $^{\dagger}$ = scheduled $^{\star}$ = presented by co-author	<ul> <li>Information aggregation and distributed learning environments         <ul> <li>Rutgers University, Seminar*</li> </ul> </li> <li>Leveraging Large Language Models for Collective         <ul> <li>Microsoft Research, Invited Applied Research Talks</li> </ul> </li> </ul>	November 2023	
	• Production Networks Resilience: Cascading Fai	_	
	and Optimal Interventions	,	
	<ul> <li>Columbia University, Student Theory Seminar</li> </ul>	November 2023	
	- Cornell University, Theory Tea	November 2023	
	<ul> <li>INFORMS Annual Meeting<sup>⋆</sup></li> </ul>	October 2023	
	- Cornell University, LinkedIn Campus Visit	May 2023	
	• Resource Allocation in a Financial Contagion En	vironment	
	- University of Chicago, Theory Seminar	$October\ 2023$	
	<ul> <li>Indiana University, Center for Complex Networks an September 2023</li> </ul>	d Systems Research	
	- Cornell University, CS 6850 Guest Lecture	April 2023	
	- Cornell University, Theory Seminar	November 2022	
	• Dynamic Interventions for Networked Contagions		
	- Invited Talk at INFORMS Annual Meeting	October 2023	
	- ACM Web Conference	April 2023	
	- ACM Conference on Equity and Access in Algorith	-	
	Optimization	October 2022	
	• Core-periphery Models for Hypergraphs		
	- ACM Conference on Knowledge Discovery and Data Mining August 2022		
	• GLINKX: A Scalable Unified Framework for Homophilous and Hetero-		
	$philous \ Graphs$		
	- NeurIPS Workshop on Graph Learning Frontiers	$December\ 2022$	
	- Twitter, Machine Learning Seminar	August~2022	
	• Allocating Stimulus Checks in Times of Crisis	-	
	- ACM Web Conference	April 2022	

	Optimization	October 2021		
	• Sampling from Truncated High Dimensional Logconcave	$e\ Densities$		
	– PyData Global	December 2020		
	• Software Clusterings with Vector Semantics and the Call Graph			
	- ACM Joint Meeting on European Software Engineering	Conference and		
	Symposium on the Foundations of Software Engineering	August 2019		
SERVICE	• Program Commitee			
	<ul> <li>ACM Conference on Fairness Accountability and Transp 2022</li> </ul>	arency (FAccT)		
	<ul> <li>ACM Conference on Knowledge Discovery and Data Minin</li> <li>Reviewing</li> </ul>	ng (KDD) 2023		
	- ACM Web Conference (WWW)	2024		
	- Innovations in Theoretical Computer Science (ITCS)	2024 2024		
	- ACM Conference on Human Factors in Computing (CHI)	2024		
	European Conference on Machine Learning and Principles and Practice of			
	Knowledge Discovery in Databases (ECML-PKDD)	2023		
	- Machine Learning (Springer)			
	- NeurIPS 2022 Workshop on Graph Learning Frontiers (GL	Frontiers) 2022		
	<ul> <li>NeurIPS 2021 Workshop on Human and Machine Decisions</li> </ul>	s 2021-		
	<ul> <li>Journal of Open Source Software</li> </ul>	2021-		
	• Mentorship			
	- Student-applicant Support Program at Cornell CIS	2022		
	- Google Summer of Code	2019-2022		

- ACM Conference on Equity and Access in Algorithms, Mechanisms, and

LAST UPDATED December 23, 2023