Marios Papachristou

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Areas

Algorithms, Information Networks, LLMs, Differential Privacy, Machine Learning, Data Mining

EDUCATION

Cornell University

2020 - exp. 2026

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

- Advisor: Jon Kleinberg

M.S. in Computer Science

2020 - 2022

[profile]

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 Marios Papachristou*. "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, Yuan Yuan. "Network Formation and Dynamics among Multi-LLMs". *Under review.* 2024.

[preprint] [slides]

[W2] 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]

- [W3] Marios Papachristou, Longqi Yang, Chin-Chia Hsu, "Leveraging Large Language Models for Collective Decision-Making". *Under review.* 2023. [preprint]
- [W4] Marios Papachristou, Amin Rahimian. "Group Decision-Making among Privacy-aware Agents". Under review. 2023.
 Preliminary version accepted at the AAAI Workshop on Privacy-Preserving Artificial Intelligence. 2023.
 [preprint] [poster]
- [W5] Marios Papachristou, Amin Rahimian. "Differentially Private Distributed Estimation and Learning". *Under review.* 2023.

 [preprint] [code] [poster]
- [W6] 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]
- [W7] 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]
- [W8] 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 Longgi 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) - Project: Sampling from high-dimensional truncated log-concave [code] [talk1] [talk2]	$20 - August \ 2020 \ densities.$
	Google Summer of Code 2018 (GFOSS-OTA) April 2018 Project: 3gm. Automated codification of Greek Legislation. [code] [data] [talk]	-September 2018
	Researcher – P2P Lab	2013 - 2014
Honors & Awards	 Onassis Scholarship LinkedIn Ph.D. Fellowship (14.8% acceptance rate) Gerondelis Scholarship A.G. Leventis Scholarship (12.5% acceptance rate) Chateaubriand Fellowship (declined) Cornell Fellowship Thomaidion Award ESEC/FSE 2019 ACM Student Research Competition Finalist 4th (out of 93) in International Space Engineering Competition 	2023 2022 2022 2022 2022 2020 2019 2019 2019
	 2nd Award at the "be finnovative 2.0 accelerator" 1st Award at "Crowdhackathon Fintech #2" Top %1 worldwide in IEEEXtreme 11.0 Programming Competing Touramanoglu Scholarship "The Great Moment of Education" Scholarship 	$\begin{array}{c} 2018 \\ 2017 \\ \text{tion} \\ 2017 \\ 2015 \\ 2015 \end{array}$
TEACHING EXPERIENCE	 The Structure of Information Networks (PhD-level, Cornell) Spr. Discrete Mathematics (NTUA) Programming Techniques (NTUA) Introduction to Computer Programming (NTUA) 	ring & Fall 2023 Spring 2017 Spring 2016 I 2016, Fall 2017
Talks & Presentations †= scheduled *= presented by co-author	 Network Formation and Dynamics among Multi-LLMs Cornell AI, Policy, and Practice Group Learning on Graphs (LoG) NYC Meetup Information Aggregation and Distributed Learning in Fenvironments Information: Theory and Applications (ITA) Workshop* Rutgers University, Seminar* Leveraging Large Language Models for Collective Decis Microsoft Research, Invited Applied Research, Tellan 	March 2024 February 2024 Privacy-critical February 2024 November 2023 sion-Making
	 Microsoft Research, Invited Applied Research Talks Production Networks Resilience: Cascading Failures, and Optimal Interventions Columbia University, Student Theory Seminar Cornell University, Theory Tea INFORMS Annual Meeting* Cornell University, LinkedIn Campus Visit Resource Allocation in a Financial Contagion Environs University of Chicago, Theory Seminar Indiana University, Center for Complex Networks and Syst September 2023 Cornell University, CS 6850 Guest Lecture Cornell University, Theory Seminar Dynamic Interventions for Networked Contagions 	November 2023 November 2023 October 2023 May 2023 ment October 2023
	- Invited Talk at INFORMS Annual Meeting - ACM Web Conference	October 2023 April 2023

	 ACM Conference on Equity and Access in Algorithms, Mechanisms, and 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
	- ACM Conference on Equity and Access in Algorithms, Mechanisms, and
	Optimization October 2021
	• Sampling from Truncated High Dimensional Logconcave 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
REVIEWING	• Program Commitee
	– ACM Conference on Fairness Accountability and Transparency (FAccT) 2022
	– ACM Conference on Knowledge Discovery and Data Mining (KDD) 2023
	• Reviewing
	- ACM Web Conference (WWW)
	- Innovations in Theoretical Computer Science (ITCS) 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 (GLFrontiers) 2022 NeurIPS 2021 Workshop on Human and Machine Decisions 2021
	- Neurit S 2021 Workshop on Human and Wachine Decisions 2021- - Journal of Open Source Software 2021-
	- Journal of Open Source Software 2021-
Mentorship &	• Student-applicant Support Program at Cornell CIS 2022
Volunteering	• Google Summer of Code Mentor 2019–2022
	• Volunteer lessons for the National Olympiad of Informatics (PDP) and other programming competitions 2019
Last Updated	March 4, 2024