Marios Papachristou

Contact Information

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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 ECE (*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**, Sid Banerjee, Jon Kleinberg. "Optimal Resource Allocation for Remediating Networked Contagions". *R&R in Management Science*. 2023.

[W2] **Marios Papachristou**, Longqi Yang, Chin-Chia Hsu, "Leveraging Large Language Models for Collective Decision-Making". *Under review.* 2023

[W3] **Marios Papachristou**, Amin Rahimian. "Differentially Private Distributed Estimation and Learning". *Under review.* 2023.
[preprint] [code]

[W4] **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]
This paper extends our previous work in WWW 2022 and WWW 2023.
[slides]

[W5] **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]

[W6] **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 20234*
- 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 & Awards

- Onassis Scholarship *2023*
- LinkedIn Ph.D. Fellowship (14.8% acceptance rate) *2022*
- Gerondelis Scholarship *2022*
- A.G. Leventis Scholarship (12.5% acceptance rate) *2022*
- Chateaubriand Fellowship *(declined)* *2022*
- Cornell Fellowship *2020*
- Thomaidion Award *2019*
- ESEC/FSE 2019 ACM Student Research Competition Finalist *2019*
- 4th (out of 93) in International Space Engineering Competition (CanSat) *2019*
- 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 Competition *2017*
- Touramanoglu Scholarship *2015*
- "The Great Moment of Education" Scholarship *2015*

Teaching Experience

- The Structure of Information Networks (PhD-level, Cornell) *Spring & Fall 2023*
- Discrete Mathematics (NTUA) *Spring 2017*
- Programming Techniques (NTUA) *Spring 2016*
- Introduction to Computer Programming (NTUA) *Fall 2016, Fall 2017*

Talks & Presentations

†= scheduled
⋆= presented by co-author

- ***Leveraging Large Language Models for Collective Decision-Making***
  - Invited Applied Research Talks, Microsoft Research *August 2023*
- ***Production Networks Resilience: Cascading Failures, Power Laws, and Optimal Interventions***
  - Columbia University, Student Theory Seminar† *November 2023*
  - Cornell University, Theory Tea† *November 2023*
  - INFORMS Annual Meeting†⋆ *October 2023*
  - Cornell University, LinkedIn Campus Visit *May 2023*
- ***Resource Allocation in a Financial Contagion Environment***
  - University of Chicago, Theory Seminar *October 2023*
  - Indiana University, Center for Complex Networks and Systems Research *September 2023*
  - 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 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 Heterophilous 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*

Service

- *Program Commitee*
  - ACM Conference on Fairness Accountability and Transparency (FAccT) *2022*
  - ACM Conference on Knowledge Discovery and Data Mining (KDD) *2023*
- *Reviewing*
  - 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–*
  - Journal of Open Source Software *2021–*
- *Mentorship*
  - Student-applicant Support Program at Cornell CIS *2022*
  - Google Summer of Code *2019–2022*

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