Marios Papachristou

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Areas Machine Learning, Data Mining, Algorithms, Social and Information Networks

Education

Cornell University *2020 – exp. 2026*
Ph.D. in Computer Science (*GPA: 4.0*), 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 (*GPA: 4.0*) *2020 – 2022*

National Technical University of Athens *2015 – 2020*
Diploma in ECE (*GPA: 9.49/10.00 – top 2%*). Major: *Computer Science.*
- *Advisor:* Dimitris Fotakis

Publications
Google Scholar Profile
$^{\alpha\beta}$= alphabetical order,
* = equal contribution

1. **Marios Papachristou**, Amin Rahimian. "Differentially Private Distributed Estimation and Learning". *Under review.* 2023.
   [preprint] [code]
2. **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]
3. **Marios Papachristou**, Sid Banerjee, Jon Kleinberg, "Optimal Resource Allocation for Remediating Networked Contagions". *Under review.* 2023. This paper incorporates and extends our previous papers: link and link.
   [slides]
4. **Marios Papachristou**, Sid Banerjee, Jon Kleinberg. "Dynamic Interventions for Networked Contagions". *ACM Web Conference (WWW) 2023.*
   [preprint] [code] [poster] [paper] [slides]
5. **Marios Papachristou**, Rishab Goel, Frank Portman, Matt Miller, Rong Jin. "GLINKX: A Scalable Unified Framework for Homophilous and Heterophilous Graphs". *NeurIPS workshop on Graph Learning Frontiers (GLFrontriers)*, 2022.
   [preprint] [poster] [workshop]
6. **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]
7. **Marios Papachristou**, Jon Kleinberg. "Allocating Stimulus Checks in Times of Crisis". *ACM Web Conference (WWW) 2022.*
   [preprint] [code] [paper] [talk] [slides] [news]
8. **Marios Papachristou**. "Sublinear Domination and Core–periphery Networks". *Scientific Reports (Nature)*, 2021.
   [paper] [code]
9. $^{\alpha\beta}$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]

10. **Marios Papachristou**, Dimitris Fotakis. "Stochastic Opinion Dynamics for User Interest Prediction in Online Social Networks". *Preprint*, 2020.
[preprint]
11. **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)***
12. 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]

Research Experience

Applied Research Intern – Microsoft *May 2023 – ongoing*
- 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 2023*
– Discrete Mathematics (NTUA) *Spring 2017*
– Programming Techniques (NTUA) *Spring 2016*
– Introduction to Computer Programming (NTUA) *Fall 2016, Fall 2017*

Talks & Presentations

- ***Resource Allocation in a Financial Contagion Environment***
  – CS6850 (Cornell; guest lecture) *April 2023*
  – Cornell Theory Seminar *November 2022*
- ***Dynamic Interventions for Networked Contagions***
  – 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***
  – Workshop on Geometry and Machine Learning (presented by co-author) *June 2021*
  – 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*
  – 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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