# Marios A. Papachristou

GitHub: papachristoumarios | email: papachristoumarios@gmail.com


**Research Interests**

Data Science, Network Science, Machine Learning, Recommender Systems, Computational Law, Software Engineering, Algorithms, Optimization

**Education**

**Cornell University** *2020 – exp. 2026*

Ph.D. in Computer Science. Concentration on Data Science

- Advisor: Prof. Jon Kleinberg

**National Technical University of Athens** *2015–2020*

Diploma (5-year joint degree, 300 ECTS) Electrical & Computer Engineering (ECE)

- *GPA:* 3.8/4.0 (top 1%)
- *Major:* Computer Science (*Major GPA:* 3.8/4.0)
- *Thesis: "Stochastic Opinion Dynamics for Interest Prediction in Online Social Networks". Advisor: Dimitris Fotakis. Grade: 4.0/4.0*

**Publications** [GoogleScholar]

1. **Papachristou, Marios**. "Software clusterings with vector semantics and the call graph." ESEC/FSE 2019. DOI: 10.1145/3338906.3342483. [link]
2. Kostakis, Vasilis, and **Papachristou, Marios**. "Commons-based peer production and digital fabrication: The case of a RepRap-based, Lego-built 3D printing-milling machine." T&I, 2014. DOI: 10.1016/j.tele.2013.09.006. [link]

**Working Papers**

1. "Stochastic Opinion Dynamics for Interest Prediction in Online Social Networks". *with D. Fotakis. Submitted for publication.*
2. "Opinion Dynamics with Fairness Constraints". *with J. Kleinberg. Ongoing.*
3. "Sampling from truncated high-dimensional log-concave densities with Hamiltonian Monte Carlo: Mixing Time Analysis, Software, and Applications". *with A. Chalkis, V. Fisikopoulos, E. Tsigaridas. Ongoing.*

**Research Experience**

**Business Analytics Lab (Undergraduate Researcher)** *2018 – 2020*

- Conduct research on Machine Learning on Software Engineering: Source Code Embeddings, Software Clusterings, Layering Violations
- Research funded by the Crossminer project, supported by *Horizon 2020* grant
- Research Advisor: Prof. Diomidis Spinellis

**Hellenic Center for Marine Research** *June 2014 – August 2014*

**P2P Lab (Remote Research Associate)** *2013–2014*

**Professional Experience**

**Google Summer of Code 2020 (GeomScale)** *June 2020–*

- *Project: Sampling from high-dimensional log-concave densities*
- Develop software for the efficient sampling from high-dimensional log-concave densities using first-order oracles in (un)-truncated settings [github] [post] [talk]
- The software includes ODE and SDE solver and samplers for convex body domains (convex polytopes).

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

- Developed a fully functional project for text mining, cross-linking and automated codification of Greek Legislation using Natural Languaging Processing Methods and Practices. Project is hosted at 3gm.ellak.gr [repository]
  - Cross-linking into Dynamic Graphs
  - Automated Codification
  - Custom Version Control System

- Topic Modeling
- Embeddings
- Ranking (PageRank)
- Language Modeling and Legal Text Generation with DNNs
- Greek Legislative Texts Internet Archive Collection [link]

– Project is in active development and receives funding
– Supervise graduate student for Google Summer of Code 2019

**Ratle (Co-founder)** *October 2017–October 2018*

– Cashierless shopping system.
– Bluetooth Signal Denoising with Kalman Filters, Product tracking inside stores, Enterprise application for Business Analytics
– Tested at real stores

## Teaching Assistantship Experience

**Undergraduate Teaching Assistant**

– Discrete Mathematics (4th Semester) *Spring 2017*
– Programming Techniques (2nd Semester) *Spring 2016*
– Introduction to Computer Programming (1st Semester) *Fall 2016, Fall 2017*

## Technical Skills

**Programming Languages** Python, C/C++, Java, JavaScript/TypeScript, Bash, OCaml, PHP, R, SQL
**Machine Learning Frameworks** PyTorch, Pyro, Tensorflow Keras, Sklearn, spaCy
**Data Analysis and Visualization** matplotlib, MATLAB, pandas, Bash
**Scientific Programming** SAGE, Octave, MATLAB, Scilab, NumPy, SciPy, OpenCV, NetworkX
**Databases** MySQL, MongoDB, PostgreSQL, Firebase
**Version Control** Git, Subversion

## Honors & Awards

– Cornell New Student Fellowship (first-year).Cornell University.
– Programming Competition *IEEEXtreme 12.0*. Ranked 48th out of 4,000 Worldwide (top 1%), 1st in Greece, 13th in Europe (PComplete Team)
– 4th (out of 93) Place in *International Space Engineering Competition at Texas* (CanSat) organized by NASA Goddard and the Americal Astronautical Society
– 1st Award at *"Crowdhackathon Fintech #2"* for developing a cashierless system for retail shops to eliminate queues by National Bank of Greece
– 2nd Award at the *"be finnovative 2.0 accelerator"* for developing a cashierless system for retail shops to eliminate queues by National Bank of Greece
– ESEC/FSE 2019 ACM Student Research Competition Finalist
– 2nd Place at the *"ECESCON9"* Hackathon
– *"Touramanoglu"* Scholarship by Municipality of Helioupolis & Hymettus
– *"The Great Moment of Education"* Scholarship by Eurobank EFG

## Volunteering

– Teaching algorithms courses in National Competition for Informatics Camp
– Google Summer of Code Mentor
– Member of TEDx NTUA 2018 Organizing Committee, IT Team
– Contributor to open-source projects
– Member of Greek Free and Open-Source Software Organization GFOSS-OTA
– Voluntary Blood Donor

## References available upon request

Jon Kleinberg (Prof. at Cornell, PhD Advisor, `kleinberg@cornell.edu`)
Dimitris Fotakis (Assoc. Prof. at NTUA, U/G Advisor, `fotakis@cs.ntua.gr`)
Diomidis Spinellis (Prof. at AUEB, ex: Google, ex: GSIS SG, `dds@aueb.gr`)
Vasilis Kostakis (Harvard BKC, `kostakis@law.harvard.edu`)