

GOOGLE
SCHOLAR

<https://scholar.google.com.sg/citations?user=5NiFWwwAAAAJ&hl=en&oi=ao>

POSITIONS

University of California, Irvine, USA

Fall 2020 - Present

Assistant Professor, Department of Computer Science

Singapore University of Technology and Design (SUTD), Singapore

Fall 2018 - Fall 2020

Assistant Professor, Information Systems Technology and Design Pillar

Massachusetts Institute of Technology, Cambridge, MA, USA

Fall 2017 - Fall 2018

Postdoctoral researcher

Mentor: Constantinos Daskalakis

Singapore University of Technology and Design (SUTD), Singapore

Fall 2016 - Summer 2017

Postdoctoral researcher

VISITING
RESEARCHER

Simons Institute, UC Berkeley

Learning and Games: January-March 2022.

EDUCATION

Georgia Institute of Technology, Atlanta, GA, USA

August 2011 - 5th August 2016

- PhD in Algorithms Combinatorics and Optimization (ACO)
Dissertation Title: Evolutionary Markov Chains, Potential Games and Optimization Under the Lens of Dynamical Systems.
Advisor: Prasad Tetali
- Master of Sciences in Mathematics

University of Athens, Athens, Greece

Fall 2010 - Fall 2011

- Master of Sciences in Logic, Algorithms & Computation

National Technical University of Athens, Athens, Greece

October 2005 - November 2010

- Diploma, Electrical and Computer Engineering
Major: Computer Science, Minor: Mathematics, Networks

RESEARCH
INTERESTS

Theory of computation, machine learning and its interface with optimization, dynamical systems, probability and statistics and multi-agent Reinforcement Learning.

ACADEMIC
SERVICE

Committee Member for EC, 2019-2023, WINE 2019, 2021, AAAI 2020, NeurIPS 2019, ICML 2019.

Reviewer for

Conferences: ICALP, SODA, FOCS, STOC, AISTATS, ICLR, ICML, NeurIPS, COLT, NeurIPS, ICML, ICLR.

Journals: Mathematical Reviews (AMS), Games and Economic Behavior, IEEE Transactions on Information Theory, Math Programming, JACM.

PUBLICATIONS

1. *Efficiently Computing Nash Equilibria in Adversarial Team Markov Games* .
with Fivos Kalogiannis, Ioannis Anagnostides, Manolis Vlatakis, Vaggos Chatziafratis and Stelios Stavroulakis.
International conference on learning representations (**ICLR**) 2023, **oral**.
2. *Towards convergence to Nash equilibria in two-team zero-sum games* (with Fivos Kalogiannis and Manolis Vlatakis).
International conference on learning representations (**ICLR**) 2023.
3. *Mean estimation of truncated mixtures of two Gaussians: A gradient based approach* (with Sai Ganesh Nagarajan, Gerasimos Palaiopoulos, Tushar Vaidya and Samson Yu).
Conference on Artificial Intelligence (**AAAI**) 2023.
4. *On Scrambling Phenomena for Randomly Initialized Recurrent Networks* (with Vaggos Chatziafratis, Clayton Sanford and Stelios Stavroulakis).
Conference on Neural Information Processing Systems (**NeurIPS**) 2022.
5. *Optimistic Mirror Descent Either Converges to Nash or to Strong Coarse Correlated Equilibria in Bimatrix Games* (with Ioannis Anagnostides, Gabriele Farina and Tuomas Sandholm).
Conference on Neural Information Processing Systems (**NeurIPS**) 2022.
6. *On Last-Iterate Convergence Beyond Zero-Sum Games*.
with Ioannis Anagnostides, Gabriel Farina and Tuomas Sandholm.
International Conference on Machine Learning (**ICML**) 2022.
7. *Global Convergence of Multi-Agent Policy Gradient in Markov Potential Games*.
with S. Leonardos, W. Overman and G. Piliouras. (**ICLR**) 2022.
8. *Accelerated Multiplicative Weights Update Avoids Saddle Points almost always*.
with Yi Feng and Xiao Wang.
International Joint Conference on Artificial Intelligence (**IJCAI**) 2022.
9. *Independent Natural Policy Gradient Always Converges in Markov Potential Games*
(with Roy Fox, Stephen McAleer and Will Overman).
International Conference on Artificial Intelligence and Statistics (**AISTATS**) 2022.
10. *Frequency-Domain Representation of First-Order Methods: A Simple and Robust Framework of Analysis* (with Ioannis Anagnostides).
Symposium on Simplicity in Algorithms (**SOSA**) 2022.
11. *Last Iterate Convergence in No-regret Learning: Constrained Min-max Optimization for Convex-concave Landscapes*.
with Qi Lei, Sai Ganesh Nagarajan and Xiao Wang.
International Conference on Artificial Intelligence and Statistics (**AISTATS**) 2021.
12. *Efficient Statistics for Sparse Graphical Models from Truncated Samples*.
with Arnab Bhattacharyya, Rathin Desai and Sai Ganesh Nagarajan.
International Conference on Artificial Intelligence and Statistics (**AISTATS**) 2021.

13. *Fast Convergence of Langevin Dynamics on Manifold: Geodesics meet Log-Sobolev.*
with Qi Lei and Xiao Wang.
Conference on Neural Information Processing Systems (**NeurIPS**) 2020.
14. *Better Depth-Width Trade-offs for Neural Networks through the lens of Dynamical Systems.*
with Vaggos Chatziafratis and Sai Ganesh Nagarajan.
International Conference on Machine Learning (**ICML**) 2020.
15. *Logistic regression with group effects via inference in higher order Ising models.*
with Costis Daskalakis and Nishanth Dikkala.
International Conference on Artificial Intelligence and Statistics (**AISTATS**) 2020.
16. *Depth-Width Trade-offs for ReLU Networks via Sharkovsky's Theorem.*
with Vaggos Chatziafratis, Sai Ganesh Nagarajan and Xiao Wang.
International conference on learning representations (**ICLR**) 2020, **spotlight**.
17. *On the Analysis of EM for truncated mixtures of two Gaussians.*
with Sai Ganesh Nagarajan.
International Conference on Algorithmic Learning Theory (**ALT**) 2020.
18. *First-order methods Almost Always Avoid Saddle Points: The case of Vanishing Step-sizes.*
with Xiao Wang and Georgios Piliouras.
Conference on Neural Information Processing Systems (**NeurIPS**) 2019.
19. *Multiplicative Weights Updates as a distributed constrained optimization algorithm: Convergence to second-order stationary points almost always.*
with Georgios Piliouras and Xiao Wang.
International Conference on Machine Learning (**ICML**) 2019.
20. *Regression from Dependent Observations.* with Constantinos Daskalakis and Nishanth Dikkala. 51st ACM Symposium on Theory of Computing (**STOC**) 2019.
21. *First-order Methods Almost Surely Avoid Saddle-points.*
with Jason D. Lee, Georgios Piliouras, Max Simchowitz, Michael I. Jordan and Benjamin Recht. **Math. Programming** 2019, **special issue**.
22. *Last-Iterate Convergence: Zero-Sum Games, Constrained Min-Max Optimization.*
with Constantinos Daskalakis.
In the 10th Innovations in Theoretical Computer Science (**ITCS**) 2019.
23. *The Limit Points of (Optimistic) Gradient Descent in Min-Max Optimization.*
with Constantinos Daskalakis.
Conference on Neural Information Processing Systems (**NeurIPS**) 2018.
24. *Multiplicative Weights Update with Constant Step-Size in Congestion Games: Convergence, Limit Cycles and Chaos.* with G. Palaiopoulos and G. Piliouras.
Neural Information Processing Systems (**NeurIPS**) 2017, **spotlight**.
25. *Opinion Dynamics in Networks: Convergence, Stability and Lack of Explosion.*
with Tung Mai and Vijay V. Vazirani.
In International Colloquium on Automata, Languages and Programming (**ICALP**) 2017.
26. *Rock-Paper-Scissors, Differential Games and Biological Diversity.*
with Tung Mai, Will Ratcliff, Vijay V. Vazirani and Peter Yunker.
In Conference on Economics and Computation (**EC**) 2018.

27. *Gradient Descent Converges to Minimizers: Non-Isolated Critical Points and Invariant Regions.*
with Georgios Piliouras.
In Innovations in Theoretical Computer Science (**ITCS**) 2017.
28. *Mutation, Sexual Reproduction and Survival in Dynamic Environments.*
with Ruta Mehta, Georgios Piliouras, Prasad Tetali and Vijay Vazirani.
In Innovations in Theoretical Computer Science (**ITCS**) 2017.
29. *The Computational Complexity of Genetic Diversity.*
with Ruta Mehta, Georgios Piliouras and Sadra Yazdanbod.
In European Symposia on Algorithms (**ESA**) 2016.
30. *Average Case Performance of Replicator Dynamics in Potential Games via Computing Regions of Attraction.*
with Georgios Piliouras.
In Conference on Economics and Computation (**EC**) 2016.
31. *Mixing time of markov chains, dynamical systems and evolution.*
with Nisheeth K. Vishnoi.
In International Colloquium on Automata, Languages and Programming (**ICALP**) 2016
32. *Evolutionary Dynamics in finite populations mix rapidly.*
with Piyush Srivastava and Nisheeth K. Vishnoi.
In Symposium on Discrete Algorithms (**SODA**) 2016.
33. *Natural Selection as an Inhibitor of Genetic Diversity: Multiplicative Weights Updates Algorithm and a Conjecture of Haploid Genetics.*
with Ruta Mehta and Georgios Piliouras.
In Innovations in Theoretical Computer Science (**ITCS**) 2015.
34. *Support-theoretic subgraph preconditioners for large-scale SLAM.*
with Yong-Dian Jian, Doru Balcan, Prasad Tetali and Frank Dallelart.
In International Conference on Intelligent Robots and Systems (**IROS**) 2013.

TEACHING

- "Introduction to Algorithmic Game Theory", Fall 2021, Fall 2022.
<https://panageas.github.io/agt2022/>
- "Design and Analysis of Algorithms", Spring 2022.
<https://panageas.github.io/algo2022/>
- "Optimization for Machine Learning", Spring 2020, 2021.
<https://panageas.github.io/optml2021/>

STUDENTS AND POSTDOCS

PhD student Foivos Kalogiannis (2022-Present)
 PhD student Nikolas Patris (2022-Present)
 PhD student Stelios Stavroulakis (2022-Present)
 PhD student Sai Ganesh Nagarajan (Graduated in 2021)
 MS student Will Overman (Graduated in 2022)
 Postdoc Xiao Wang (2019-2020)

HONORS AND AWARDS

- 2 Million USD NRF fellowship for AI (2019-2020) while in SUTD.
- MIT-SUTD Postdoc Fellowship (2016-2018).
- ARC fellowship (2013-2014).
- Onassis fellowship (2011).
- Ranked 18th, 17th (top 25) in IEEE xtreme programming contest among 1000/700 teams, (2009/2010).
- Third Prize in IMC (2008).
- Silver Medal in SEEMOUS (2007).
- Papakyriakopoulos Award for excellence in Mathematics (GPA 10/10) (2006, 2007).
- Bronze medal in Balkan Olympiad in Informatics (2005).
- Participation in International Mathematical Olympiad (IMO) (2005).
- Participation in International Olympiad in Informatics (IOI) (2004, 2005).

INVITED TALKS

- Mini-Symposium on Algorithmic Game Theory at CanaDAM, June 2023
- SIAM Conf on Optimization, June 2023
- NUS, Singapore, April 2023
- Simons Institute, UC Berkeley, talk in Learning and Games, May 2022
- Purdue CS theory seminar, March 2022
- UC Santa Barbara, CS theory seminar, November 2021
- USC CS Colloquium, March 2020
- UCI AI/ML seminar series, March 2020
- MIFODS workshop, MIT, January 2020
- NUS theory group, Singapore, November 2019
- Simons Institute, UC Berkeley, talk in Deep Learning Workshop, May 2019
- UCL, Dynamical Systems workshop, February 2019
- Cornell, Ithaca, June 2018
- Northwestern Program on Econometrics, Evanston, April 2018
- CS theory seminar, UC Irvine, California, April 2018
- CS theory seminar, Ohio State, February 2018
- Seminar on Stochastic Processes, UVA, Virginia, March 2017
- Simons Institute, Berkeley, January 2017
- SUTD Brainlab, Singapore, November 2016
- IMA workshop on Graphical Models, University of Minnesota, May 2015
- Weizmann Institute of Science, Israel, January 2015
- ACO seminar, Georgia Institute of Technology, September 2014