Thodoris Lykouris

Contact Information

MIT Sloan School of Management
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Primary Employment

Assistant Professor **Jul. 2021 - present**
Massachusetts Institute of Technology, Cambridge, MA, United States

Postdoctoral Researcher **Jul. 2019 - Jun. 2021**
Microsoft Research, New York City, NY, United States

Education

Ph.D. in Computer Science **Aug. 2013 - Aug. 2019**
Cornell University, Ithaca, NY, United States

- Ph.D. thesis: *Effective online decision-making in complex multi-agent systems*
- Advisor: Éva Tardos
- Committee: Éva Tardos, Jon Kleinberg, Karthik Sridharan, Siddhartha Banerjee

Diploma in Electrical and Computer Engineering **Oct. 2006 - Oct. 2012**
National Technical University of Athens, Athens, Greece

- Diploma thesis: *Competitive diffusion and pricing under externalities*
- Supervisor: Dimitris Fotakis

Honors and Awards

George B. Dantzig Dissertation Award, Finalist (2020)
George Nicholson Student Paper Competition, Finalist (2018)
Google Fellowship in Algorithms, Optimization and Markets (2018)
Applied Probability Society Student Paper Competition, Finalist (2017)
Cornell University Fellowship (2013-2014)
University Award for graduating ECE NTUA with 2nd highest GPA (2012).

Journal articles

1. *Competitive caching with machine learned advice*
with Sergei Vassilvitskii
Journal of the ACM (JACM); vol. 68, iss. 4, art. 24, pp. 1-25, 2021
https://arxiv.org/pdf/1802.05399.pdf
Extended abstract appeared at ICML'18 (conference publication 9)

2. *Small-loss bounds for online learning with partial information*
with Karthik Sridharan and Éva Tardos
Mathematics of Operations Research (MOR); forthcoming
https://arxiv.org/pdf/1711.03639.pdf
Extended abstract appeared at COLT'18 (conference publication 11)
Finalist in George Nicholson Student Paper Competition

3. *Pricing and optimization in shared vehicle systems: An approximation framework*
with Siddhartha Banerjee and Daniel Freund
Operations Research (OR); forthcoming
https://arxiv.org/pdf/1608.06819.pdf
One-page abstract appeared at EC'17 (conference publication 12)
Finalist in Applied Probability Society Student Paper Competition

Working papers

4. *Corruption-robust exploration in episodic reinforcement learning*
with Max Simchowitz, Aleksandrs Slivkins, and Wen Sun
Under submission
https://arxiv.org/pdf/1911.08689.pdf
Extended abstract appeared at COLT'21 (conference publication 1)

5. *Contextual search in the presence of irrational agents*
with Akshay Krishnamurthy, Chara Podimata, and Robert Schapire
Under preparation
https://arxiv.org/pdf/2002.11650.pdf
Extended abstract appeared at STOC'21 (conference publication 2)

6. *Static pricing for multi-unit prophet inequalities*
with Shuchi Chawla and Nikhil Devanur
Under preparation
https://arxiv.org/pdf/2007.07990.pdf
Extended abstract to appear at WINE'21 (conference publication 3)

7. *Stochastic bandits robust to adversarial corruptions*
with Vahab Mirrokni and Renato Paes Leme
Under preparation
https://arxiv.org/pdf/1803.09353.pdf
Extended abstract appeared at STOC'18 (conference publication 10)

8. *Learning and efficiency in games with dynamic population*
with Vasilis Syrgkanis and Éva Tardos
Under preparation
https://arxiv.org/pdf/1505.00391.pdf
Extended abstract appeared at SODA'16 (conference publication 14)

Conference Publications

1. *Corruption-robust exploration in episodic reinforcement learning*
with Max Simchowitz, Aleksandrs Slivkins, and Wen Sun
34th Annual Conference on Learning Theory (**COLT 2021**)
Full version: Under submission (working paper 4)

2. *Contextual search in the presence of irrational agents*
with Akshay Krishnamurthy, Chara Podimata, and Robert Schapire
53rd ACM Annual Symposium on Theory of Computing (**STOC 2021**)
Full version: Under preparation (working paper 5)

3. *Static pricing for multi-unit prophet inequalities*
with Shuchi Chawla and Nikhil Devanur
17th Conference on Web and Internet Economics (**WINE 2021**)
Full version: Under preparation (working paper 6)

4. *Constrained episodic reinforcement learning in concave-convex and knapsack settings*
with Kianté Brantley, Miroslav Dudík, Sobhan Miryoosefi, Max Simchowitz, Aleksandrs Slivkins, and Wen Sun
34th Annual Conference on Neural Information Processing Systems (**NeurIPS 2020**)
https://arxiv.org/pdf/2006.05051.pdf

5. *Bandits with adversarial scaling*
with Vahab Mirrokni and Renato Paes Leme
37th International Conference on Machine Learning (**ICML 2020**)
https://arxiv.org/pdf/2003.02287.pdf

6. *Advancing subgroup fairness via sleeping experts*
   with Avrim Blum
   11th Innovations in Theoretical Computer Science Conference (**ITCS 2020**)
   https://arxiv.org/pdf/1909.08375.pdf

7. *Feedback graph regret bounds for Thompson Sampling and UCB*
   with Éva Tardos and Drishti Wali
   31st International Conference on Algorithmic Learning Theory (**ALT 2020**)
   https://arxiv.org/pdf/1905.09898.pdf

8. *On preserving non-discrimination when combining expert advice*
   with Avrim Blum, Suriya Gunasekar, and Nathan Srebro
   32nd Annual Conference on Neural Information Processing Systems (**NeurIPS 2018**)
   https://arxiv.org/pdf/1810.11829.pdf

9. *Competitive caching with machine learned advice*
   with Sergei Vassilvitskii
   35th International Conference on Machine Learning (**ICML 2018**)
   Journal version: *Journal of the ACM, 2021* (journal article 1)

10. *Stochastic bandits robust to adversarial corruptions*
    with Vahab Mirrokni and Renato Paes Leme
    50th ACM Annual Symposium on Theory of Computing (**STOC 2018**)
    https://arxiv.org/pdf/1803.09353.pdf
    Full version: Under preparation (working paper 7)

11. *Small-loss bounds for online learning with partial information*
    with Karthik Sridharan and Éva Tardos
    31st Annual Conference on Learning Theory (**COLT 2018**)
    Journal version: Forthcoming in *Math. of OR* (journal article 2)

12. *Pricing and optimization in shared vehicle systems: An approximation framework*
    with Siddhartha Banerjee and Daniel Freund
    18th ACM Conference on Economics and Computation (**EC 2017**)
    Journal version: Forthcoming in *Operations Research* (journal article 3)

13. *Learning in games: Robustness of fast convergence*
    with Dylan Foster, Zhiyuan Li, Karthik Sridharan, and Éva Tardos
    30th Annual Conference on Neural Information Processing Systems (**NeurIPS 2016**)
    https://arxiv.org/pdf/1606.06244.pdf

14. *Learning and efficiency in games with dynamic population*
    with Vasilis Syrgkanis and Éva Tardos
    27th ACM-SIAM Symposium on Discrete Algorithms (**SODA 2016**)
    https://arxiv.org/pdf/1505.00391.pdf
    Full version: Under preparation (working paper 8)

15. *Influence maximization in switching-selection threshold models*
    with Dimitris Fotakis, Evangelos Markakis and Svetlana Obraztsova
    7th International Symposium on Algorithmic Game Theory (**SAGT 2014**)

Teaching experience

Guest instructor

- One guest lecture for Fall 2020 Columbia IEOR graduate course *Machine Learning for Algorithm Design* of Eric Balkanski
- One guest lecture for Fall 2020 Cornell CS graduate course *Foundations of Reinforcement Learning* of Wen Sun and Sham Kakade
- Two guest lectures for Spring 2017 Cornell CS graduate course *Algorithmic Game Theory* of Éva Tardos

- Two guest lectures for Spring 2013 National Technical University of Athens ECE course *Approximation algorithms and Algorithmic Mechanism Design* of Dimitris Fotakis

Teaching assistant

- Sole teaching assistant for the Cornell CS graduate course *Algorithmic Game Theory* (Spring 2017)
- Member of a small group developing and grading programming and analytical problems for National Technical University of Athens ECE undergraduate course *Algorithms and Complexity* (Fall 2010, Fall 2011, Fall 2012)
- Helping students in programming assignments for National Technical University of Athens ECE undergraduate course *Introduction to Programming* (Fall 2011, Fall 2012)

Professional service

Program organizer:

- **Interdisciplinary semester-long program** on *Data-driven decision processes* with Shipra Agrawal, Siddhartha Banerjee, and Shuchi Chawla
  August-December 2022, Simons Institute, Berkeley, USA

Workshop organizer:

- **ICML 2020 workshop** on *Theoretical foundations of Reinforcement Learning* with Emma Brunskill, Max Simchowitz, Wen Sun, and Mengdi Wang
  July 2020, virtual (scheduled for Vienna, Austria; moved due to COVID pandemic)

Journal Refereeing:
Management Science (MS), Mathematics of Operations Research (MOR), Operations Research (OR), Journal of the ACM (J.ACM), Journal of Machine Learning Research (JMLR), Transactions on Algorithms (TALG), Transactions on Economics and Computation (TEAC), Theory of Computing Systems (TOCS)

Conference Program Committee (or Reviewing Committee for ML conferences):

- Symposium on Discrete Algorithms (SODA): 2022
- Conference on Learning Theory (COLT): 2020, 2021
- Economics and Computation (EC): 2020, 2021
- International Conference on Machine Learning (ICML): 2020
- Neural Information Processing Systems (NeurIPS): 2019, 2020
- Algorithmic Learning Theory (ALT): 2022
- The Web Conference (TheWebConf): 2019, 2020

Conference Subreviewing:
STOC, FOCS, SODA, ICALP, ALT, ICML, NeurIPS , SIGMETRICS, WWW, AAMAS, WINE, SAGT

INFORMS Award Judge:

- Applied Probability Society Student Paper Competition: 2021, 2022
- Health Application Society Pierskalla Award Competition: 2021

Internships & Research visits

Research intern at Microsoft Research Redmond (May-August 2018)
Visiting student at TTI-Chicago hosted by Avrim Blum (March-May 2018)
Research intern at Google Research NYC (May-August 2017)
Visiting student at Simons Institute in Berkeley for semesters on *Real-time decision making* (January-March 2018) & *Economics and Computation* (August-December 2015)
Research intern at Microsoft Research India (June-August 2015)