ANA-ANDREEA STOICA

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Research Interests — *Machine Learning, Social Networks, Game Theory.*

My work focuses on designing algorithms and evaluation methods for multi-objective optimization problems with applications in society. My work combines efficiency and societal objectives using unsupervised learning techniques, game theory, and behavioral and sociological modeling.

ACADEMIC APPOINTMENTS

Research Group Leader,   2023-
Max Planck Institute for Intelligent Systems, Tübingen, Germany
Social Foundations of Computation Department, led by Moritz Hardt

Simons Fellow,   Fall 2022
Simons Institute For Theory of Computing
University of California at Berkeley

Doctoral Research Assistant,   2016-2022
Computer Science Department, Columbia University   New York, NY
Advisor: Associate Professor Augustin Chaintreau

EDUCATION

Columbia University,   New York, NY
Ph.D, Computer Science Department   2022
M.Sc., M.Phil., Computer Science Department   2016, 2018
Advisor: Associate Professor Augustin Chaintreau

Princeton University,   Princeton, NJ
B.A., Mathematics Department   2016
Graduated *magna cum laude.*
Undergraduate Advisor: Professor Emmanuel Abbe
Certificates: *Applied & Computational Mathematics, Applications of Computing*

SELECTED FELLOWSHIPS, AWARDS, AND HONORS

P.I. for Alfred Sloan Foundation Grant 2022-19495 for ACM EAAMO'22, $40,000   2022

Davide Giri Memorial Award for excellence in research and collaborations, Columbia University   2022

MIT EECS Rising Stars Workshop   2021

8th Heidelberg Laureate Forum   2021

J.P. Morgan AI Research PhD Fellowship   2019–2020

Andrew P. Kosoresow Memorial Award for excellence in teaching, Columbia University   2018

International Zhautykov Mathematics Olympiad, Bronze Medal   2010

Romanian National Mathematics Olympiad, 1 Gold, 2 Silver, and 3 Bronze medals   2007–2012

Diploma of Excellence awarded by Prime Minister of Romania   2008

PREPRINTS & OTHER WRITINGS

Ana-Andreea Stoica*, Michael Xu*, and Francesca Parise. "Committee mediated opinion dynamics in multi-community populations." *Under submission.*

Faidra Monachou*, **Ana-Andreea Stoica***. "Fairness and equity in resource allocation and decision-making: an annotated reading list." ACM SIGecom Exchanges, 2022.

PUBLICATIONS

Jiduan Wu, Rediet Abebe*, Moritz Hardt*, **Ana-Andreea Stoica***. "Policy Design in Long-run Welfare Dynamics." Proceedings of the Thirteenth International Conference on Learning Representations (ICLR), 2025 [pdf]

Rashida Hakim, **Ana-Andreea Stoica**, Christos H Papadimitriou, Mihalis Yannakakis. "The Fairness-Quality Trade-off in Clustering". The Thirty-Eighth Annual Conference on Neural Information Processing Systems (NeurIPS), 2024. [pdf]

- **LuWSI'25**: oral presentation at the 2nd Workshop on Learning Under Weakly Structured Information, March 2025.
- **ADT'24**: oral presentation at the 8th Intl. Conference on Algorithmic Decision Theory, October 2024.

Shubham Chowdhary, Giulia De Pasquale*, Nicolas Lanzetti*, **Ana-Andreea Stoica**, Florian Dörfler. "Fairness in Social Influence Maximization via Optimal Transport". The Thirty-Eighth Annual Conference on Neural Information Processing Systems (NeurIPS), 2024. [pdf]

- **EWAF'25**: oral presentation at the 4th European Workshop on Algorithmic Fairness, July 2025.

Ana-Andreea Stoica, Vivian Y. Nastl, and Moritz Hardt. "Causal Inference from Competing Treatments". International Conference on Machine Learning (ICML), 2024. [pdf]

- **WALE'24**: oral presentation at the Workshop on Algorithms for Learning and Economics, June 2024.

Ana-Andreea Stoica, Nelly Litvak, and Augustin Chaintreau. "Fairness Rising from the Ranks: HITS and PageRank on Homophilic Networks". Proceedings of the ACM on Web Conference, 2024. [pdf]

- **ACM EAAMO'24**: oral presentation at the ACM Conference on Equity and Access in Algorithms, Mechanisms, and Optimization, October 2024.

Ayse Gizem Yasar, Andrew Chong*, Evan Dong*, Thomas Gilbert*, Sarah Hladikova*, Carlos Mougan*, Xudong Shen*, Shubham Singh*, **Ana-Andreea Stoica***, and Savannah Thais*. "Integration of Generative AI in the Digital Markets Act: Contestability and Fairness from a Cross-Disciplinary Perspective". LSE Legal Studies Working Paper, 2024. [pdf]

- **ML meets Law '25**: oral presentation at Machine Learning meets Law, University of Tübingen, February 2025.
- **RegulatableML @ NeurIPS'24**: oral presentation at the RegulatableML Workshop at the Thirty-Eighth Annual Conference on Neural Information Processing Systems (NeurIPS), December 2024.
- **Article19'24**: oral presentation at the Article19 Symposium on DMA enforcement: Trends and gaps in the first year of application, November 2024.

Alexandra Olteanu et al. "FACTS-IR: Fairness, Accountability, Confidentiality, Transparency, and Safety in Information Retrieval." In ACM SIGIR Forum, vol. 53, no. 2, pp. 20-43, 2021. [pdf]

Jessie Finocchiaro*, Roland Maio*, Faidra Monachou*, Gourab K Patro*, Manish Raghavan*, **Ana-Andreea Stoica***, and Stratis Tsirtsis*. "Fairness and Discrimination in Mechanism Design and Machine Learning." Proceedings of the Fairness, Accountability, and Transparency Conference (FAccT), 2021. [pdf]

- **AI4SG Workshop, IJCAI'20**: oral presentation at the AI for social good workshop at IJCAI, July 2020.

Ana-Andreea Stoica and Christos Papadimitriou. "Strategic Clustering." Spotlight at NeurIPS'21 Workshop on Learning in Presence of Strategic Behavior. Neural Information Processing Systems, 2021.

Ana-Andreea Stoica, Abhijnan Chakraborty, Palash Dey, Krishna P. Gummadi. "Minimizing Margin of Victory for Fair Political and Educational Districting." Proceedings of the 19th International Conference on Autonomous Agents and MultiAgent Systems. International Foundation for Autonomous Agents and Multiagent Systems, 2020. [pdf]

- **WINE'19:** poster at the Web and Internet Economics Conference, December 2019.

Ana-Andreea Stoica, Jessy Xinyi Han, Augustin Chaintreau. "Strategic influence maximization in networks with partial information." Proceedings of the 2020 World Wide Web Conference. International World Wide Web Conferences Steering Committee, 2020. [pdf]

- **WINE'19:** poster at the Web and Internet Economics Conference, December 2019.
- **IC2S2'20:** poster at the International Conference on Computational Social Science, July 2020.

Ana-Andreea Stoica and Augustin Chaintreau. "Hegemony in Social Media and the effect of recommendations." Companion Proceedings of the 2019 World Wide Web Conference. International World Wide Web Conferences Steering Committee, 2019. [pdf]

Ana-Andreea Stoica and Augustin Chaintreau. "Fairness in the Social Influence Maximization Problem." Companion Proceedings of the 2019 World Wide Web Conference. International World Wide Web Conferences Steering Committee, 2019. [pdf]

Ana-Andreea Stoica, Christopher Riederer, and Augustin Chaintreau. "Algorithmic Glass Ceiling in Social Networks: The effects of social recommendations on network diversity." Proceedings of the 2018 World Wide Web Conference. International World Wide Web Conferences Steering Committee, 2018. [pdf]

- **MD4SG'18:** oral presentation at the Mechanism Design for Social Good Workshop, July 2018.
- **HALG'18:** oral presentation at the Highlights of Algorithms Workshop, June 2018.

Assimakis A. Kattis, Alexander Holiday, **Ana-Andreea Stoica**, and Ioannis G. Kevrekidis. "Modeling epidemics on adaptively evolving networks: A data-mining perspective." Virulence 7.2 (2016): 153-162. [pdf]

*Equal contribution.

THESES

Ana-Andreea Stoica. "Algorithmic Design for Social Networks: Inequality, Bias, and Diversity." Columbia University Ph.D. Thesis, 2022. Advisor: Prof. Augustin Chaintreau. [pdf]

Ana-Andreea Stoica. "Community Detection in the Hypergraph Stochastic Block Model." Princeton University Undergraduate Thesis, 2016. Advisor: Prof. Emmanuel Abbe. [pdf] Presented at:

- **New York Computer Science and Economics Day** (NYCE 2017) Poster session, New York University, New York, NY, USA. May 19th, 2017.
- **Fifth Networking Networking Women Workshop** (N^2 Women) Poster session, City University of New York, New York, NY, USA. October 3rd, 2016.

PROFESSIONAL EXPERIENCE

Research Intern Summer, 2021
Advisor: Jon Kleinberg *Cornell University, NY*
· Working at the intersection of algorithmic design and optimization, in understanding fairness and equity considerations in multi-stage optimization systems, with applications in public goods provisions.

Research Intern Summer, 2019
Advisor: Prof. Krishna Gummadi *Max Planck Institute for Software Systems, Germany*
· Designed voting mechanisms for clustering individuals into districts without creating disparate impact.

Research Intern Spring, 2019
Advisor: Siddhartha Sen *Microsoft Research, NYC*
· Worked at the intersection of machine learning and databases, developing machine learning algorithms for building a universal data index that is able to adapt to different workloads in an online fashion. *Manuscript in preparation.*

Graph Clustering Algorithms 2015–2016
Senior Thesis with Prof. Emmanuel Abbe *Princeton University, NJ*
· Extended random graph algorithms for recovering communities in the general hypergraph stochastic block model.

Modeling epidemics on adaptively evolving networks 2015–2016
Independent Work with Prof. Yannis Kevrekidis *Princeton University, NJ*
· Implementated of dimensionality reduction techniques on random graph algorithms modeling epidemics.

TALKS

Invited speaker, Cambridge Ellis Unit Summer School on Probabilistic Machine Learning	July, 2025
Invited speaker, Workshop on Algorithmic Fairness @ European Control Conference	June, 2025
Invited seminar, EconCS Seminar Series, Harvard University	March, 2025
Invited seminar, MIT	March, 2025
Invited speaker, 2nd Workshop on Learning Under Weakly Structured Information, U of Tübingen	March, 2025
Invited speaker, Machine Learning meets Law, AI & Law Institute, University of Tübingen	February, 2025
Invited seminar, Socially Intelligent Artificial Systems Group, University of Amsterdam	December, 2024
Invited seminar, Foundations of AI Seminar Series, University of Warwick	November, 2024
Invited speaker, PhilML'24 Conference, University of Tübingen	September, 2024
Invited seminar, Network Inequality Lecture Series, Complexity Science Hub	July, 2024
Invited speaker, Workshop on Humans, Algorithmic Decision-Making and Society, ICML	July, 2024
Invited speaker, Workshop on Algorithms for Learning and Economics, Greece	June, 2024
Invited seminar, Responsible AI Seminar Series, Archimedes AI Institute	April, 2024
Invited speaker, Machine Learning from Theory to Application Workshop, University of Tübingen	March, 2024
Invited speaker, Romanian Algorithms Day	July, 2023
Invited speaker, R U Social Conference, Reichman University	May, 2023
Invited seminar, Econometrics Seminar Series at the University of Oxford	April, 2023
Invited seminar, Psychology Department Seminar Series at New York University	September, 2022
Invited seminar, Data & Democracy Seminar, New York University	March, 2022
Invited seminar, Women in Combinatorics Colloquium Series	February, 2022
Invited seminar, Young Achievers Symposium, Pennsylvania State University	February, 2022
Invited seminar, Northeastern University and Network Science Institute	November, 2021
Invited seminar, Responsible Data Science, UIUC	November, 2021
Invited seminar, University of Bucharest	November, 2021
Invited speaker, GRASP SFI Seminar Series, University of Pennsylvania	October, 2021
Invited speaker, University of Melbourne, Quantitative Methods Network	October, 2021
Invited speaker, INFORMS Annual Meeting, Diversity/PSOR/MIF	October, 2021

Invited speaker, QuantumBlack	August, 2021
Invited speaker, Romanian Algorithms Day	June, 2021
Invited speaker, Machine Learning Seminar Series, Morgan Stanley	May, 2021
Invited speaker, Computational Social Science Workshop, University of Chicago	April, 2021
Invited speaker, Harvard CRCS Rising Star in AI for Social Good, Harvard University	April, 2021
Invited poster, CAIS Symposium on Equity and AI, University of Southern California	April, 2021
Invited speaker, Theory of Computing for Fairness Seminar Series, Simons Institute	February, 2021
Invited speaker, ML Seminar Series, Oracle	February, 2021
Invited speaker, Fair February, Brown University	February, 2021
Invited panelist, NeurIPS 2020 Workshop on Fair AI in Finance	December, 2020
Invited speaker, The Analytical Foundations of Deep Learning Workshop, C3.ai Institute	October, 2020
Invited panelist, Inspired AI @ World Summit AI, virtual	October, 2020
Invited seminar, Rising Stars in Computer Science Seminar, UMass Amherst	September, 2020
Invited panelist, NIH Biomedical Informatics Coordinating Committee	August, 2020
Invited speaker, MGGG Graphs & Networks Workshop, Tufts University	July, 2020
Invited speaker, BitHacks hackathon, New York	June, 2020
Invited speaker, Impact Fellowship, New York	January, 2020
Invited panelist, Fordham IPLJ Symposium, Fordham University, New York, NY	October, 2019
Invited speaker, Women in Data Science Workshop at the Web Conference '18, Lyon, France	April, 2018
Invited seminar, Ecole Polytechnique Federale de Lausanne, Lausanne, Switzerland	May, 2018
Invited seminar, Cambridge University, Cambridge, UK	May, 2018
Invited seminar, Alan Turing Institute, London, UK	May, 2018

LEADERSHIP AND PROFESSIONAL SERVICE

ACM Conference on Equity and Access in Algorithms, Mechanisms, and Optimization (ACM EAAMO) [website]   2021–
· Co-founder, Program Co-Chair for ACM EAAMO'21, and Executive Committee member for the inaugural ACM EAAMO Conferences series.

EAAMO Bridges (formerly known as Mechanism Design for Social Good [website]   2019–
· Director of Finance for the EAAMO non-profit organization, an interdisciplinary research initiative that includes workshops, colloquiums, and partnerships with academics, non-profits, and community organizations.

Area Chair & Program Committee
· Area Chair: Mechanism Design for Social Good Workshop 2020 (and Member of the Steering Committee) [website]
· Program Committee Member: ACM FAccT'22-'25, NeurIPS'21,'24-'25, ECAI'24-'25, IC2S2'22-'25, EWAF'23-'25,TheWebConf'19-'24, AISTATS'21-'24, AAAI'20-'23, FAccTRec'21-'23, WSDM'22, ACM COMPASS'21, FILA'20, Workshop on AI for Social Good @ IJCAI'19-'21, Workshop on AI for Social Good @ NeurIPS'19, Workshop on Fairness, Accountability, Confidentiality, Transparency, and Safety in IR @ SIGIR'19.
· Reviewer: Journal of Complex Networks, Journal of Causal Inference, Elsevier Fuzzy Sets and Systems Journal, Springer Nature Autonomous Agents and Multi-Agent Systems Journal.

AI4ALL Summer Program   June-July 2020, 2021
· Led a team of instructors for the AI4ALL Summer Program for high school students, teaching courses on various topics in AI and mentoring students.

Cyber 9/12 Student Challenge,Washington D.C.   March 17–18, 2017
· Team leader. Drafted policy proposals for an international cybersecurity challenge organized by the Atlantic Council.

Black in AI   2019–2020
· Mentor for undergraduate students, assisting with graduate applications questions related to Ph.D. programs in Computer Science and AI, with a focus on underrepresented groups.

TEACHING EXPERIENCE

Guest Lectures
· Invited guest lecture at Cornell Tech, "Networks and Markets"   Spring 2024
· Invited guest lectures on social networks and ethics in A.I. at Columbia University:

- Introduction to Networks and Crowds   Spring 2020

- Introduction to Social Networks   Spring 2018

- AI Safety, Ethics, and Policy   Spring 2018

Introduction to Social Networks   Fall, 2016; Spring 2018
Columbia University, New York, NY
· Teaching Assistant. Held weekly office hours, graded homework assignments, and assisted with final projects.

MEDIA COVERAGE

Algorithmic Glass Ceiling in Social Networks:
· Columbia Engineering News, la Republica, The Tribune, The Times of India, The Morning Paper.

The 1st ACM Conference on Equity and Access in Algorithms, Mechanisms, and Optimization:
· Columbia Computer Science News, INFORMS Magazine.