

Andrea Celli

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Research interests

Topics at the intersection of Computer Science, Economics, Optimization & Machine Learning. In particular, I am interested in equilibrium computation problems, online learning, decision making under uncertainty, multi-agent learning, mechanism design, and market design problems.

Employment

Assistant Professor **Milan**
Bocconi University, Computing Sciences Department September 2021 – Present

Postdoctoral researcher **London**
Facebook Core Data Science June 2020 – June 2021

Postdoctoral researcher **Milan**
Politecnico di Milano November 2019 – May 2020

Other Affiliations

Research Affiliate
Bocconi Institute for Data Science and Analytics September 2021 – Present

Member
European Laboratory for Learning and Intelligent Systems (ELLIS) October 2021 – Present

Education

Politecnico di Milano **Milan**
PhD in Computer Science 2016 – February 2020

Carnegie Mellon University **Pittsburgh**
Visiting Scholar Jan 2018 – May 2018

Politecnico di Milano **Milan**
MSc in Computer Science and Engineering, Grade: 110 cum laude/110 2014 – 2016

Politecnico di Milano **Milan**
BSc in Computer Science and Engineering, Grade: 110 cum laude/110 2011 – 2014

Publications

Conference Papers

- [C1] M. Bernasconi, M. Castiglioni, **A. Celli**, A. Marchesi, F. Trovò, N. Gatti, "Optimal rates and efficient algorithms for online bayesian persuasion," in *ICML*, 2023.
- [C2] V. Avadhanula, **A. Celli**, R. Colini-Baldeschi, S. Leonardi, M. Russo, "Fully dynamic online selection through online contention resolution schemes," in *AAAI*, 2023.
- [C3] M. Castiglioni, **A. Celli**, A. Marchesi, G. Romano, N. Gatti, "A unifying framework for online optimization with long-term constraints," in *NeurIPS*, 2022.
- [C4] M. Castiglioni, **A. Celli**, C. Kroer, "Online learning with knapsacks: The best of both worlds," in *ICML*, 2022.

- [C5] B. Zhang, G. Farina, **A. Celli**, T. Sandholm, "Optimal correlated equilibria in general-sum extensive-form games: Fixed-parameter algorithms, hardness, and two-sided column-generation," in *EC*, 2022.
- [C6] I. Anagnostides, G. Farina, C. Kroer, **A. Celli**, T. Sandholm, "Faster no-regret learning dynamics for extensive-form correlated and coarse correlated equilibria," in *EC*, 2022.
- [C7] G. Birmpas, **A. Celli**, R. Colini-Baldeschi, S. Leonardi, "Fair equilibria in sponsored search auctions: The advertisers' perspective," in *IJCAI*, 2022.
- [C8] **A. Celli**, R. Colini-Baldeschi, C. Kroer, E. Sodomka, "The parity ray regularizer for pacing in auction markets," in *TheWebConf*, 2022.
- [C9] G. Farina, **A. Celli**, N. Gatti, T. Sandholm, "Connecting optimal ex-ante collusion in teams to extensive-form correlation: Faster algorithms and positive complexity results," in *ICML*, 2021.
- [C10] M. Castiglioni, A. Marchesi, **A. Celli**, N. Gatti, "Multi-receiver online bayesian persuasion," in *ICML*, 2021.
- [C11] M. Castiglioni, **A. Celli**, A. Marchesi, N. Gatti, "Signaling in bayesian network congestion games: The subtle power of symmetry," in *AAAI*, 2021.
- [C12] F. Cacciamani, **A. Celli**, M. Ciccone, N. Gatti, "Multi-agent coordination in adversarial environments through signal mediated strategies," in *AAMAS*, 2021.
- [C13] **A. Celli**, A. Marchesi, G. Farina, N. Gatti, "No-regret learning dynamics for extensive-form correlated equilibrium," in *NeurIPS (Oral presentation and best paper award)*, also appeared at *Highlights Beyond EC '21 and IJCAI SCBP '21*, 2020.
- [C14] M. Castiglioni, **A. Celli**, A. Marchesi, N. Gatti, "Online bayesian persuasion," in *NeurIPS (Spotlight presentation)*, 2020.
- [C15] **A. Celli**, S. Coniglio, N. Gatti, "Private bayesian persuasion with sequential games," in *AAAI*, 2020.
- [C16] M. Castiglioni, **A. Celli**, N. Gatti, "Persuading voters: It's easy to whisper, it's hard to speak loud," in *AAAI*, 2020.
- [C17] **A. Celli**, A. Marchesi, T. Bianchi, N. Gatti, "Learning to correlate in multi-player general-sum sequential games," in *NeurIPS*, 2019.
- [C18] **A. Celli**, S. Coniglio, N. Gatti, "Computing optimal ex ante correlated equilibria in two-player sequential games," in *AAMAS*, 2019.
- [C19] **A. Celli**, G. Romano, N. Gatti, "Personality-based representations of imperfect-recall games," in *AAMAS (Extended Abstract)*, 2019.
- [C20] G. Farina, **A. Celli**, N. Gatti, T. Sandholm, "Ex ante coordination and collusion in zero-sum multi-player extensive-form games," in *NeurIPS*, 2018.
- [C21] **A. Celli** and N. Gatti, "Computational results for extensive-form adversarial team games," in *AAAI*, 2018.
- [C22] **A. Celli**, A. Marchesi, N. Gatti, "On the complexity of nash equilibrium reoptimization," in *UAI*, 2017.
- [C23] N. Basilico, **A. Celli**, G. De Nittis, N. Gatti, "Team-maxmin equilibrium: Efficiency bounds and algorithms," in *AAAI*, 2017.
- [C24] N. Basilico, **A. Celli**, G. D. Nittis, N. Gatti, "Coordinating multiple defensive resources in patrolling games with alarm systems," in *AAMAS*, 2017.

Journal Papers

- [J1] M. Castiglioni, **A. Celli**, N. Gatti, "Public bayesian persuasion: Being almost optimal and almost persuasive," *Algorithmica*, 2023.
- [J2] M. Castiglioni, **A. Celli**, A. Marchesi, N. Gatti, "Regret minimization in online bayesian persuasion: Handling adversarial receiver's types under full and partial feedback models," *Artificial Intelligence Journal (AIJ)*, 2023.
- [J3] G. Farina, **A. Celli**, A. Marchesi, N. Gatti, "Simple uncoupled no-regret learning dynamics for extensive-form correlated equilibrium," *Journal of the ACM*, 2022.

- [J4] **A. Celli** and A. Marchesi, "Learning dynamics in limited-control repeated games," *Intelligenza Artificiale*, 2018.
- [J5] N. Basilico, **A. Celli**, G. D. Nittis, N. Gatti, "Computing the team-maxmin equilibrium in single-team single-adversary team games," *Intelligenza Artificiale*, 2017.

Workshop Papers.....

- [W1] M. Castiglioni, **A. Celli**, A. Marchesi, G. Romano, N. Gatti, "A unifying framework for online optimization with long-term constraints," in *NeurIPS ML Safety workshop*, 2022.
- [W2] B. Zhang, G. Farina, **A. Celli**, T. Sandholm, "Optimal correlated equilibria in general-sum extensive-form games: Fixed-parameter algorithms, hardness, and two-sided column-generation," in *ICLR, Workshop on Gamification and Multiagent Solutions*, 2022.
- [W3] G. Farina, **A. Celli**, N. Gatti, T. Sandholm, "Connecting optimal ex-ante collusion in teams to extensive-form correlation: Faster algorithms and positive complexity results," in *AAAI, Workshop on Reinforcement Learning in Games*, 2022.
- [W4] **A. Celli**, R. Colini-Baldeschi, C. Kroer, E. Sodomka, "The parity ray regularizer for pacing in auction markets," in *Sixth Marketplace Innovation Workshop (MIW)*, 2021.
- [W5] G. Farina, **A. Celli**, N. Gatti, T. Sandholm, "Faster algorithms for optimal ex-ante coordinated collusive strategies in extensive-form zero-sum games," in *AAAI, Workshop on Reinforcement Learning in Games*, 2021.
- [W6] M. Castiglioni, **A. Celli**, A. Marchesi, N. Gatti, "Online bayesian persuasion," in *AAAI, Workshop on Reinforcement Learning in Games*, 2021.
- [W7] **A. Celli**, A. Marchesi, G. Farina, N. Gatti, "No-regret learning dynamics for extensive-form correlated equilibrium," in *AAAI, Workshop on Reinforcement Learning in Games*, 2021.
- [W8] —, "No-regret learning dynamics for extensive-form correlated equilibrium," in *NeurIPS, Cooperative AI Workshop*, 2020.
- [W9] F. Cacciamani, **A. Celli**, M. Ciccone, N. Gatti, "Multi-agent coordination through signal mediated strategies," in *NeurIPS, Cooperative AI Workshop*, 2020.
- [W10] G. Farina, **A. Celli**, N. Gatti, T. Sandholm, "Faster algorithms for optimal ex-ante coordinated collusive strategies in extensive-form zero-sum games," in *NeurIPS, Cooperative AI Workshop*, 2020.
- [W11] **A. Celli**, A. Marchesi, T. Bianchi, N. Gatti, "Learning to correlate in multi-player general-sum sequential games," in *NeurIPS, Smooth Games Optimization and Machine Learning Workshop*, 2019.
- [W12] G. Farina, **A. Celli**, N. Gatti, T. Sandholm, "Ex ante coordination in team games," in *AAAI, Workshop on Reinforcement Learning in Games*, 2019.
- [W13] **A. Celli** and A. Marchesi, "Nash equilibrium reoptimization is hard," in *IJCAI, Algorithmic Game Theory Workshop*, 2017.
- [W14] N. Basilico, **A. Celli**, G. D. Nittis, N. Gatti, "Coordinating multiple defensive resources in patrolling games with alarm systems," in *AAMAS, Workshop on Adversarial Reasoning in Multi-Agent Systems*, 2017.

Teaching

- o Machine Learning, Bocconi University (B.Sc. class), Professor
Spring 2023
- o Optimization, Bocconi University (Ph.D. in Statistics and Computer Science), Professor
Fall 2021, Fall 2022
- o Algorithms, Bocconi University (M.Sc. class), Professor
Spring 2022
- o Computer Programming and Database Systems, Bocconi University (M.Sc. class), Professor
Fall 2021, Fall 2022

- o Game Theory, Politecnico di Milano (M.Sc.), TA 2019–2020
- o Informatica A, Politecnico di Milano (B.Sc.), TA '18–'19, '19–'20
- o Economics and Computation, Politecnico di Milano (M.Sc.), TA '17–'18, '18–'19

Other courses

- o Race Strategies Computation, Ferrari S.p.A. 2019

Honors and Awards

- o NeurIPS 2020 Best Paper Award 2020
- o Lesmo Award for the best Italian MSc Thesis in Artificial Intelligence 2017
- o National Doctoral Scholarship 2016–2019
Sponsored by the Ministry of Education, Universities and Research

Invited Talks and Seminars

- o Workshop “Learning in games”, Institute for Mathematical Sciences, Singapore 2023
- o London School of Economics Seminar Series on Combinatorics, Games and Optimisation 2022
- o ELLIS Milan Artificial Intelligence workshop 2022
- o INFORMS session on Operations Research at Facebook 2021
- o Algorithmic Bayesian Persuasion 2021
At the explAI workshop (Virtual)
- o No-Regret Learning Dynamics for Extensive-Form Correlated Equilibrium 2021
At Facebook London ML Seminars (Virtual)
- o No-Regret Learning Dynamics for Extensive-Form Correlated Equilibrium 2021
At Facebook Economics, Algorithms and Optimization Seminars (Virtual)
- o No-Regret Learning Dynamics for Extensive-Form Correlated Equilibrium 2021
At Coveo ML Seminars (Virtual)
- o Bayesian Persuasion in Voting Scenarios 2019
At MAPLE'19 (Markets, Algorithms, Prediction and Learning) in Milan
- o Adversarial Team Games 2017
At the International Conference of the Italian Association for Artificial Intelligence
- o Bayesian Persuasion 2017
At Politecnico di Milano, Permanent Itinerant Game Theory Seminars (P.I.G.S.)
- o Adversarial Team Games 2017
At University of Milan-Bicocca, Permanent Itinerant Game Theory Seminars (P.I.G.S.)

Service

- o **PC:** AAAI ('18–'23), ECAI ('20), IJCAI ('20–'23), NeurIPS ('20–'23), WINE ('21), ICML ('22, '23).
- o **Reviewing:** AAMAS ('17), IJCAI ('17–'19), TheWebConf ('20), ICML ('21), EC ('21–'22), SODA ('23), Journal of Economic Theory ('22), Management Science ('22)

External Funding

- o **2023-2025:** MIUR PRIN Project “Targeted Learning Dynamics: Computing Efficient and Fair Equilibria through No-Regret Algorithms”. PI. €195,200
- o **2022-2023:** "Multi-agent learning and equilibrium (EquiLearn)" funded by Civica Research. With Galit Ashkenazi-Golan, Katerina Papadaki, Bernhard von Stengel (PI), and Mark Voorneveld.

Organization of International Events

- o **2023:** Co-organizer of the “Algorithms, Learning, and Games” (ALGA) workshop, June 5-9 2023, Scicli (Italy).

Programming and Frameworks

- o Programming languages: Python, Java, C, R
- o Optimization frameworks: AMPL, CPLEX, Gurobi, Xpress

Languages

- o Italian: mother tongue
- o English: proficient user
 - o IELTS Academic, Overall band score 8 (level C2) 2013