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. Castiglioni, **A. Celli**, A. Marchesi, G. Romano, N. Gatti, "A unifying framework for online optimization with long-term constraints," in *NeurIPS*, 2022.

[C2] M. Castiglioni, **A. Celli**, C. Kroer, "Online learning with knapsacks: The best of both worlds," in *ICML*, 2022.

[C3] 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.

[C4] 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.

[C5]   G. Birmpas,   **A. Celli**,   R. Colini-Baldeschi,   S. Leonardi, "Fair equilibria in sponsored search auctions: The advertisers' perspective," in *IJCAI*, 2022.

[C6]   **A. Celli**,   R. Colini-Baldeschi,   C. Kroer,   E. Sodomka, "The parity ray regularizer for pacing in auction markets," in *TheWebConf*, 2022.

[C7]   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.

[C8]   M. Castiglioni,   A. Marchesi,   **A. Celli**,   N. Gatti, "Multi-receiver online bayesian persuasion," in *ICML*, 2021.

[C9]   M. Castiglioni,   **A. Celli**,   A. Marchesi,   N. Gatti, "Signaling in bayesian network congestion games: The subtle power of symmetry," in *AAAI*, 2021.

[C10] F. Cacciamani,   **A. Celli**,   M. Ciccone,   N. Gatti, "Multi-agent coordination in adversarial environments through signal mediated strategies," in *AAMAS*, 2021.

[C11] **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.

[C12] M. Castiglioni,   **A. Celli**,   A. Marchesi,   N. Gatti, "Online bayesian persuasion," in *NeurIPS (Spotlight presentation)*, 2020.

[C13] **A. Celli**,   S. Coniglio,   N. Gatti, "Private bayesian persuasion with sequential games," in *AAAI*, 2020.

[C14] M. Castiglioni,   **A. Celli**,   N. Gatti, "Persuading voters: It's easy to whisper, it's hard to speak loud," in *AAAI*, 2020.

[C15] **A. Celli**,   A. Marchesi,   T. Bianchi,   N. Gatti, "Learning to correlate in multi-player general-sum sequential games," in *NeurIPS*, 2019.

[C16] **A. Celli**,   S. Coniglio,   N. Gatti, "Computing optimal ex ante correlated equilibria in two-player sequential games," in *AAMAS*, 2019.

[C17] **A. Celli**,   G. Romano,   N. Gatti, "Personality-based representations of imperfect-recall games," in *AAMAS (Extended Abstract)*, 2019.

[C18] G. Farina,   **A. Celli**,   N. Gatti,   T. Sandholm, "Ex ante coordination and collusion in zero-sum multi-player extensive-form games," in *NeurIPS*, 2018.

[C19] **A. Celli** and   N. Gatti, "Computational results for extensive-form adversarial team games," in *AAAI*, 2018.

[C20] **A. Celli**,   A. Marchesi,   N. Gatti, "On the complexity of nash equilibrium reoptimization," in *UAI*, 2017.

[C21] N. Basilico,   **A. Celli**,   G. De Nittis,   N. Gatti, "Team-maxmin equilibrium: Efficiency bounds and algorithms," in *AAAI*, 2017.

[C22] 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]   G. Farina,   **A. Celli**,   A. Marchesi,   N. Gatti, "Simple uncoupled no-regret learning dynamics for extensive-form correlated equilibrium," *Journal of the ACM*, 2022.

[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)*, 2022.

[J3]   M. Castiglioni,   **A. Celli**,   N. Gatti, "Public bayesian persuasion: Being almost optimal and almost persuasive," *Under review*, 2021.

[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 Optimization, Bocconi University (Ph.D.), Professor — 2021-2022

o Algorithms, Bocconi University (M.Sc.), Professor — 2021-2022

o Computer Programming and Database Systems, Bocconi University (M.Sc.), Professor 2021-2022

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 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 explAIn 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–'22), NeurIPS ('20–'22), WINE ('21), ICML ('22).
- 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 **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.

Programming and Frameworks

- o Programming languages: Python, Java, C, R, RUST
- 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