

# Andrea Celli

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## Research interests

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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, market design problems.

## Employment

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<b>Assistant Professor</b> <i>Bocconi University, Computing Sciences Department</i>	<b>Milan</b> <i>September 2021 – Present</i>
<b>Postdoctoral researcher</b> <i>Facebook Core Data Science</i>	<b>London</b> <i>June 2020 – June 2021</i>
<b>Postdoctoral researcher</b> <i>Politecnico di Milano</i>	<b>Milan</b> <i>November 2019 – May 2020</i>

## Other Affiliations

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<b>Research Affiliate</b> <i>Bocconi Institute for Data Science and Analytics</i>	<i>September 2021 – Present</i>
<b>Member</b> <i>European Laboratory for Learning and Intelligent Systems (ELLIS)</i>	<i>October 2021 – Present</i>

## Education

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<b>Politecnico di Milano</b> <i>PhD in Computer Science</i>	<b>Milan</b> <i>2016 – February 2020</i>
<b>Carnegie Mellon University</b> <i>Visiting Scholar</i>	<b>Pittsburgh</b> <i>Jan 2018 – May 2018</i>
<b>Politecnico di Milano</b> <i>MSc in Computer Science and Engineering, Grade: 110 cum laude/110</i>	<b>Milan</b> <i>2014 – 2016</i>
<b>Politecnico di Milano</b> <i>BSc in Computer Science and Engineering, Grade: 110 cum laude/110</i>	<b>Milan</b> <i>2011 – 2014</i>

## Publications

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### Conference Papers

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- [C1] 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 (accepted for publication)*, 2022.
- [C2] 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 (accepted for publication)*, 2022.
- [C3] G. Bimpas, **A. Celli**, R. Colini-Baldeschi, S. Leonardi, "Fair equilibria in sponsored search auctions: The advertisers' perspective," in *IJCAI (accepted for publication)*, 2022.

- [C4] **A. Celli**, R. Colini-Baldeschi, C. Kroer, E. Sodomka, "The parity ray regularizer for pacing in auction markets," in *TheWebConf*, 2022.
- [C5] 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.
- [C6] M. Castiglioni, A. Marchesi, **A. Celli**, N. Gatti, "Multi-receiver online bayesian persuasion," in *ICML*, 2021.
- [C7] M. Castiglioni, **A. Celli**, A. Marchesi, N. Gatti, "Signaling in bayesian network congestion games: The subtle power of symmetry," in *AAAI*, 2021.
- [C8] F. Cacciamani, **A. Celli**, M. Ciccone, N. Gatti, "Multi-agent coordination in adversarial environments through signal mediated strategies," in *AAMAS*, 2021.
- [C9] **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.
- [C10] M. Castiglioni, **A. Celli**, A. Marchesi, N. Gatti, "Online bayesian persuasion," in *NeurIPS (Spotlight presentation)*, 2020.
- [C11] **A. Celli**, S. Coniglio, N. Gatti, "Private bayesian persuasion with sequential games," in *AAAI*, 2020.
- [C12] M. Castiglioni, **A. Celli**, N. Gatti, "Persuading voters: It's easy to whisper, it's hard to speak loud," in *AAAI*, 2020.
- [C13] **A. Celli**, A. Marchesi, T. Bianchi, N. Gatti, "Learning to correlate in multi-player general-sum sequential games," in *NeurIPS*, 2019.
- [C14] **A. Celli**, S. Coniglio, N. Gatti, "Computing optimal ex ante correlated equilibria in two-player sequential games," in *AAMAS*, 2019.
- [C15] **A. Celli**, G. Romano, N. Gatti, "Personality-based representations of imperfect-recall games," in *AAMAS (Extended Abstract)*, 2019.
- [C16] G. Farina, **A. Celli**, N. Gatti, T. Sandholm, "Ex ante coordination and collusion in zero-sum multi-player extensive-form games," in *NeurIPS*, 2018.
- [C17] **A. Celli** and N. Gatti, "Computational results for extensive-form adversarial team games," in *AAAI*, 2018.
- [C18] **A. Celli**, A. Marchesi, N. Gatti, "On the complexity of nash equilibrium reoptimization," in *UAI*, 2017.
- [C19] N. Basilico, **A. Celli**, G. De Nittis, N. Gatti, "Team-maxmin equilibrium: Efficiency bounds and algorithms," in *AAAI*, 2017.
- [C20] 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," *Under review*, 2021.
- [J2] M. Castiglioni, **A. Celli**, N. Gatti, "Public bayesian persuasion: Being almost optimal and almost persuasive," *Under review*, 2021.
- [J3] **A. Celli** and A. Marchesi, "Learning dynamics in limited-control repeated games," *Intelligenza Artificiale*, 2018.
- [J4] 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] 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.

- [W2] 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.
- [W3] **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.
- [W4] 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.
- [W5] M. Castiglioni, **A. Celli**, A. Marchesi, N. Gatti, "Online bayesian persuasion," in *AAAI, Workshop on Reinforcement Learning in Games*, 2021.
- [W6] **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.
- [W7] —, "No-regret learning dynamics for extensive-form correlated equilibrium," in *NeurIPS, Cooperative AI Workshop*, 2020.
- [W8] F. Cacciamani, **A. Celli**, M. Ciccone, N. Gatti, "Multi-agent coordination through signal mediated strategies," in *NeurIPS, Cooperative AI Workshop*, 2020.
- [W9] 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.
- [W10] **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.
- [W11] G. Farina, **A. Celli**, N. Gatti, T. Sandholm, "Ex ante coordination in team games," in *AAAI, Workshop on Reinforcement Learning in Games*, 2019.
- [W12] **A. Celli** and A. Marchesi, "Nash equilibrium reoptimization is hard," in *IJCAI, Algorithmic Game Theory Workshop*, 2017.
- [W13] 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

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- Optimization, Bocconi University (Ph.D.) 2021-2022
- Algorithms, Bocconi University (M.Sc.) 2021-2022
- Computer Programming and Database Systems, Bocconi University (M.Sc.) 2021-2022
- Race Strategies Computation, Ferrari S.p.A. 2019
- Game Theory, Politecnico di Milano, TA 2019-2020
- Informatica A, Politecnico di Milano, TA '18-'19, '19-'20
- Economics and Computation, Politecnico di Milano, TA '17-'18, '18-'19

## Honors and Awards

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

## Talks

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### Invited Talks

- INFORM session on Operations Research at Facebook 2021

- Algorithmic Bayesian Persuasion 2021  
At the explAI workshop (Virtual)
- No-Regret Learning Dynamics for Extensive-Form Correlated Equilibrium 2021  
At Facebook London ML Seminars (Virtual)
- No-Regret Learning Dynamics for Extensive-Form Correlated Equilibrium 2021  
At Facebook Economics, Algorithms and Optimization Seminars (Virtual)
- No-Regret Learning Dynamics for Extensive-Form Correlated Equilibrium 2021  
At Coveo ML Seminars (Virtual)
- Bayesian Persuasion in Voting Scenarios 2019  
At MAPLE'19 (Markets, Algorithms, Prediction and Learning) in Milan
- Adversarial Team Games 2017  
At the International Conference of the Italian Association for Artificial Intelligence

### Seminars.....

- Bayesian Persuasion 2017  
At Politecnico di Milano, Permanent Itinerant Game Theory Seminars (P.I.G.S.)
- Adversarial Team Games 2017  
At University of Milan-Bicocca, Permanent Itinerant Game Theory Seminars (P.I.G.S.)

### Service

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- **PC:** AAI '18-'21, ECAI '20, IJCAI '20-'22, NeurIPS '20-'21, WINE '21, ICML '22.
- **Reviewing:** AAMAS '17, IJCAI '17-'19, WWW '20, ICML '21, EC '21-'22

### Programming and Frameworks

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

### Languages

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