Matteo Castiglioni

Curriculum Vitae et Studiorum

Personal Information

Date of Birth	June 21, 1994
Place of Birth	Tradate, Varese
Citinzenship	Italian
Email	matcasti00@gmail.com

Work Information

University	Politecnico di Milano
Department	Dipartimento di Elettronica, Informazione e Bioingegneria (DEIB)
Address	Via Golgi 39, 20133, Milano (MI), Italy
Email	matteo.castiglioni@polimi.it
Webpage	https://castiglionimatteo.github.io

Highlights

Matteo Castiglioni is an assistant professor (RTD-A) at the Department of Electronics, Information, and Bioenginnering of Politecnico di Milano. His research focuses on artificial intelligence, algorithmic game theory and online learning. In particular, his research aims to combine machine learning techniques with economic paradigms to build strategic agents able to act in complex multi-agent environments. He got his PhD in Information Technology with laude from Politecnico di Milano with a thesis on asymmetric-information games and Bayesian persuasion under the supervision of Nicola Gatti. His Phd thesis was awarded the *Premio Cadoli*, awarded by AIxIA to the best Italian PhD thesis on artificial intelligence, and the Chorafas Award, awarded by the Dimitris N. Chorafas Foundation. He is the author of more than 40 peer reviewed research papers. In particular, he published in the premier AI journals such as *Artificial Intelligence* (6), and in the premier AI conferences ICML (9), AAAI (6), EC (5), IJCAI (4), NeurIPS (4), ICLR (3). He serves as a program committee member in several top-tier conferences. He teaches a M.Sc. course on online learning at Politecnico di Milano. He also taught several courses at BSc and PhD level. He participated in several industrial and research projects, assuming the position of principal investigator in some projects. Currently, he is co-PI of a research unit in the "ELIAS" project funded by HORIZON-RIA.

Experience

2023 — **Assistant Professor (RTD-A)**, *Politecnico di Milano*, Milano

2022 – 2023 — **Postdoctoral Researcher**, *Politecnico di Milano*, Milano

Education

2018
2022

PhD in Computer Science and Engineering, *Politecnico di Milano*, Milano,
Thesis: Reducing the Gap between Theory and Applications in Algorithmic Bayesian Persuasion
Advisor: Prof. Nicola Gatti

2016
2018

MSc in Computer Science and Engineering, *Politecnico di Milano*, Milano,
Thesis: Leadership in singleton congestion games: what is hard and what is easy
Advisor: Prof. Nicola Gatti
Mark *110 cum laude/110*

2013
2016

BSc in Computer Science and Engineering, *Politecnico di Milano*, Milano
Mark *110/110*

Research Interests

His research focuses on *Artificial Intelligence*, especially Algorithmic Game Theory, Allocation Problems and Incentives, Social Influence, and Online Learning.

Algorithmic Game Theory
He is interested in the computational complexity of finding equilibria, and the development of efficient algorithm to compute equilibria both in full-information and online problems. In particular, his research focuses on the computation of equilibria in leader-follower games, Bayesian persuasion, and contract theory. Moreover, he is interested in the design of no-regret online learning algorithms for these problems.

Allocation Problems and Incentives
He is interested in the design of incentive compatible mechanisms for allocation problems, *e.g.,* auctions, and on the design of utility-maximizing algorithms for a single agent that takes part to these mechanisms, *e.g.,* bidders in auctions. His research mainly focuses on the design of efficient bidding strategies in repeated auctions with long-term constraints, *e.g.*, budget and return on investment constraints, using online learning algorithms.

Social Influence
He is interested in the study of the diffusion of information in social networks. He investigated the problem of manipulating elections and voting scenarios by persuasion and social influence. He provided the conditions under which the manipulation is affordable and when it is not, showing that computing the optimal manipulation is a computational intractable problem in basic settings.

Online Learning
He is interested in the design of online learning problems. In particular, his research focuses on the design of no-regret algorithms for game theory problems. Moreover, he his interested in online problems with uncertain long-term safety constraints.

Scientific Production and Metrics

Scientific Productivity
Author of 9 journal papers: 6 AIJ, 1 JAIR, 1 Algorithmica, 1 L-CSS, all top ranked Q1 journal papers (SCIMAGO).
Author of 35 publications on peer-reviewed international conferences: 27 A++, 5 A+, 2 A, 1 A- according to GGS rating including 9 ICML, 6 AAAI, 5 EC, 4 IJCAI, 4 NeurIPS, 3 ICLR, 2 AAMAS, 1 STOC.

publication impact:
Based on Google Scholar: h-index 16 citations 716
Based on Scopus: h-index 10 citations 312

Awards and Recognition

Winner of Premio per NeoDottori di Ricerca Marco Cadoli 2022 (AIxIA)
Award for the best Italian PhD thesis on artificial intelligence.

Winner of the Chorafas Award
Award by the Dimitris N. Chorafas Foundation to the best PhD students of each patner university.

Member of the ELLIS society
within the Milan ELLIS unit.

National Doctoral Scholarship
Three-years doctoral scholarship sponsored by the Ministry of Education, Universities and Research.

Research and Industrial Projects

2023 – 2027 **ELIAS**, European Union
Description: Research project.
Role: Co-PI of Unit.

2023 **Distributed Mission Planning Algorithms ad Guidance**, MBDA Italia S.p.a.
Description: Industrial project.
Role: Co-PI.

2023 – 2026 **PNRR-PE FAIR - Future Artificial Intelligence Research**, NextGenerationEU, European Union
Description: Research project.
Role: Research scientist.

2019 – 2022 **PRIN 2017 ALGADIMAR**, Ministry of Education, Universities and Research, Italy
Description: Research project.
Role: Research scientist.

2022 – 2022 **Digital Advertising in the Metaverse**, Locify Inc., USA
Description: Industrial project.
Role: Research scientist.

2019 – 2020 **BidMatic**, *AdsHotel*
Description: Industrial project.
Role: Research scientist.

2019 – 2020 **RocketAvoid**, *Analisi & Valore and Marina Militare*
Description: Industrial project.
Role: Research scientist.

Publications

Conference Papers

Bernasconi M., Castiglioni M., Celli A.
Agent-Designed Contracts: How to Sell Hidden Actions
The 25th ACM Conference on Economics and Computation, EC 2024, New Haven, USA

Cacciamani F., Bernasconi M., Castiglioni M., Gatti N.
Multi-Agent Contract Design beyond Binary Actions
The 25th ACM Conference on Economics and Computation, EC 2024, New Haven, USA

Castiglioni M., Celli A., Kroer C.
Online Learning under Budget and ROI Constraints via Weak Adaptivity
41st International Conference on Machine Learning, ICML 2024, Vienna, Austria

Stradi F., Germano J., Genalti G., Castiglioni M., Marchesi A., Gatti N.
Online Learning in CMDPs: Handling Stochastic and Adversarial Constraints
41st International Conference on Machine Learning, ICML 2024, Vienna, Austria

Genalti G., Mussi M., Gatti N., Restelli M., Castiglioni M., Metelli A.
Graph-Triggered Rising Bandits
41st International Conference on Machine Learning, ICML 2024, Vienna, Austria

Bernasconi M., Castiglioni M., Celli A., Fusco F.
No-Regret Learning in Bilateral Trade via Global Budget Balance
56th Annual ACM Symposium on Theory of Computing, STOC 2024, Vancouver, Canada

Bacchiocchi F., Castiglioni M., Marchesi A., Gatti N.
Learning Optimal Contracts: How to Exploit Small Action Spaces
12th International Conference on Learning Representations, ICLR 2024, Vienna, Austria

Cacciamani F., Castiglioni M., Gatti N.
Online Information Acquisition: Hiring Multiple Agents
12th International Conference on Learning Representations, ICLR 2024, Vienna, Austria

Bernasconi M., Castiglioni M., Celli A., Fusco F.
Bandits with Replenishable Knapsacks: the Best of both Worlds
12th International Conference on Learning Representations, ICLR 2024, Vienna, Austria

Castiglioni M., Latino A., Marchesi A., Romano G., Gatti N., Palayamkottai C.
Finding Effective Ad Allocations: How to Exploit User History
23rd International Conference on Autonomous Agents and Multiagent Systems, AAMAS 2024, Auckland, New Zealand

Montazeri M, Castiglioni M., Romano G., Hamed K., Gatti N.
Maximizing Revenue from Selfish Agents in Crowd Tasks: Indirect Incentive Strategies
63rd IEEE Conference on Decision and Control , CDC 2024, Milan, Italy

Bernasconi M., Castiglioni M., Marchesi A., Mutti M.
Persuading Farsighted Receivers in MDPs: the Power of Honesty
37th Conference on Neural Information Processing Systems, NeurIPS 2023, New Orleans, USA

Castiglioni M., Marchesi A., Gatti N.
Online Multi-Agent Contract Design: How to Commission Multiple Agents with Individual Outcome
The 24th ACM Conference on Economics and Computation, EC 2023, London, UK

Cacciamani F., Castiglioni M., Gatti N.
Online Mechanism Design for Information Acquisition
The 40th International Conference on Machine Learning, ICML 2023, Honolulu, USA

Bernasconi M., Castiglioni M., Marchesi A., Trovò F., Gatti N.
Constrained Phi-Equilibria
The 40th International Conference on Machine Learning, ICML 2023, Honolulu, USA

Bernasconi M, Castiglioni M., Celli A., Marchesi A., Celli A. Gatti N., Trovò F.
Optimal Rates and Efficient Algorithms for Online Bayesian Persuasion
The 40th International Conference on Machine Learning, ICML 2023, Honolulu, USA

Castiglioni M., Celli A., Marchesi A., Romano G., Gatti N.
A Unifying Framework for Online Optimization with Long-Term Constraints
36th Conference on Neural Information Processing Systems, NeurIPS 2022, New Orleans, USA

Bernasconi M., Castiglioni M., Marchesi A., Gatti N., Trovò F.
Sequential Information Design: Learning to Persuade in the Dark
36th Conference on Neural Information Processing Systems, NeurIPS 2022, New Orleans, USA

Castiglioni M., Marchesi A., Gatti N.
Designing Menus of Contracts Efficiently: the Power of Randomization
The 23rd ACM Conference on Economics and Computation, EC 2022, Boulder, USA

Castiglioni M., Celli A., Kroer C.
Online Learning with Knapsacks: the Best of Both Worlds
The 39th International Conference on Machine Learning, ICML 2022, Baltimora, USA

Bernasconi M., Cacciamani F., Castiglioni M., Marchesi A., Gatti N., Trovò F.
Safe Learning in Tree-Form Sequential Decision Making: Handling Hard and Soft Constraints
The 39th International Conference on Machine Learning, ICML 2022, Baltimora, USA

Bacchiocchi F., Castiglioni M., Marchesi A., Romano G., Gatti N.
Public Signaling in Bayesian Ad Auctions
The 31st International Joint Conference on Artificial Intelligence, IJCAI 2022, Vienna, Austria

Romano G., Castiglioni M., Marchesi A., Gatti N.
The Power of Media Agencies in Ad Auctions: Improving Utility through Coordinated Bidding
The 31st International Joint Conference on Artificial Intelligence, IJCAI 2022, Vienna, Austria

Castiglioni M., Marchesi A., Gatti N.
Bayesian Persuasion Meets Mechanism Design: Going Beyond Intractability with Type Reporting
The 21st International Conference on Autonomous Agents and Multiagent Systems, AAMAS 2022, Virtual conference

Castiglioni M., Romano G., Marchesi A., Gatti N.
Signaling in Posted Price Auctions
The 36th AAAI Conference on Artificial Intelligence, AAAI 2022, Virtual conference

Castiglioni M., Ferraioli D., Gatti N., Marchesi A., Romano G.
Efficiency of Ad Auctions with Price Displaying
The 36th AAAI Conference on Artificial Intelligence, AAAI 2022, Virtual conference

Castiglioni M., Marchesi A., Celli A. Gatti N.
Multi-Receiver Online Bayesian Persuasion
The 38th International Conference on Machine Learning, ICML 2021, Virtual conference

Castiglioni M., Marchesi A., Gatti N.
Bayesian Agency: Linear Versus Tractable Contracts
The 22nd ACM Conference on Economics and Computation, EC 2021, Virtual conference

Castiglioni M., Celli A., Marchesi A., Gatti N.
Signaling in Bayesian Network Congestion Games: the Subtle Power of Symmetry
The 35th AAAI Conference on Artificial Intelligence, AAAI 2021, Virtual conference

Castiglioni M., Gatti N.
Persuading Voters in District-based Elections
The 35th AAAI Conference on Artificial Intelligence, AAAI 2021, Virtual conference

Castiglioni M., Celli A., Marchesi A., Gatti N.
Online Bayesian Persuasion
34th Conference on Neural Information Processing Systems, NeurIPS 2020, Virtual conference

Castiglioni M., Ferraioli D., Gatti N.
Election Control in Social Networks via Edge Addition or Removal
34th AAAI Conference on Artificial Intelligence, AAAI 2020, New York, USA

Castiglioni M., Celli A., Gatti N.
Persuading Voters: It's Easy to Whisper, It's Hard to Speak Loud
34th AAAI Conference on Artificial Intelligence, AAAI 2020, New York, USA

Castiglioni M., Marchesi A., Gatti N.
Be a Leader or Become a Follower:The Strategy to Commit to with Multiple Leaders
28th International Joint Conference on Artificial Intelligence, IJCAI 2019, Macao, China

Marchesi A., Castiglioni M., Gatti N.
Leadership in Congestion Games: Multiple User Classes and Non-Singleton Actions
28th International Joint Conference on Artificial Intelligence, IJCAI 2019, Macao, China

Journal Papers

Montazeri M., Castiglioni M., Romano G., Kebriaei H., Gatti N.
Maximizing Revenue from Selfish Agents in Crowd Tasks: Indirect Incentive Strategies
IEEE Control Systems Letters, 2024

Castiglioni M., Marchesi A., Romano G., Gatti N.
Increasing Revenue in Bayesian Posted Price Auctions through Signaling
Artificial Intelligence Journal, 2023

Castiglioni M., Celli A., Gatti N.
Public bayesian persuasion: being almost optimal and almost persuasive
Algorithmica, 2023

Castiglioni M., Marchesi A., Gatti N.
Designing Menus of Contracts Efficiently: the Power of Randomization
Artificial Intelligence Journal, 2023

Castiglioni M., Celli A., Marchesi A., Gatti N.
Regret minimization in online Bayesian persuasion: Handling adversarial receiver's types under full and partial feedback models
Artificial Intelligence Journal, 2023

Bernasconi M., Cacciamani F., Castiglioni M.
A framework for safe decision making: A convex duality approach
Intelligenza Artificiale, 2023

Castiglioni M., Marchesi A., Gatti N.
Bayesian Agency: Linear Versus Tractable Contracts
Artificial Intelligence Journal, 2022

Castiglioni M., Ferraioli D., Gatti N., Landriani G.
Election Manipulation on Social Networks: Seeding, Edge Removal, Edge Addition
Journal of Artificial Intelligence Research, 2021

Castiglioni M., Marchesi A., Gatti N.
Committing to Correlated Strategies with Multiple Leaders
Artificial Intelligence Journal, 2021

Castiglioni M., Marchesi A., Gatti N., Coniglio S.
Leadership in singleton congestion games: What is hard and what is easy
Artificial Intelligence Journal, 2019

Talks

Invited Talks

Dec. 2022 **Reducing the Gap between Theory and Applications in Algorithmic Bayesian Persuasion**
The 21st International Conference of the Italian Association for Artificial Intelligence, AIxIA 2202, Udine, Italy

Presentations at International Conferences

Jul. 2024 **Multi-Agent Contract Design beyond Binary Actions**
The 25th ACM Conference on Economics and Computation, EC 2024, New Haven, USA

Jul. 2023 **Online Multi-Agent Contract Design: How to Commission Multiple Agents with Individual Outcome**
The 24th ACM Conference on Economics and Computation, EC 2023, London, UK

Jul. 2022 **Designing Menus of Contracts Efficiently: the Power of Randomization**
The 23rd ACM Conference on Economics and Computation, EC 2022, Boulder, USA

Jul. 2021 **Bayesian Agency: Linear Versus Tractable Contracts**
The 22nd ACM Conference on Economics and Computation, EC 2021, Virtual conference

Feb. 2021 **Signaling in Bayesian Network Congestion Games: the Subtle Power of Symmetry**
The 35th AAAI Conference on Artificial Intelligence, AAAI 2021, Virtual conference

Feb. 2021 **Persuading Voters in District-based Elections**
The 35th AAAI Conference on Artificial Intelligence, AAAI 2021, Virtual conference

Dec. 2020 **Online Bayesian Persuasion**
The 34th Conference on Neural Information Processing Systems, NeurIPS 2020, Virtual conference

Feb. 2020 **Election Control in Social Networks via Edge Addition or Removal**
The 34th AAAI Conference on Artificial Intelligence, AAAI 2020, New York, USA

Aug. 2019 **Leadership in Congestion Games: Multiple User Classes and Non-Singleton Actions**
The 28th International Joint Conference on Artificial Intelligence, IJCAI 2019, Macao, China

Presentations at International Workshop

Jun. 2023 **Designing Menus of Contracts Efficiently: the Power of Randomization**
Algorithms, Learning, and Games (ALGA) Workshop, Scicli, Italy

Sep. 2022 **Bayesian Persuasion Meets Mechanism Design: Going Beyond Intractability with Type Reporting**
Ellis Workshop, Milan

Dec. 2020 **Online Bayesian Persuasion**
ALGADIMAR annual Meeting 2020, Virtual

Organization of Scientific Meetings

2023–2023

Co-Chair, *SPIRIT 2023, Workshop on Strategies, Prediction, Interaction, and Reasoning in Italy*, co-located with 22nd International Conference of the Italian Association for Artificial Intelligence AIxIA 2023.

Editorial Activities

International Conferences

2020–2022

Program Committee Member, *AAAI conference on Artificial Intelligence, AAAI*.

2022 **Program Committee Member**, *International Conference on Machine Learning, ICML*.

2022 **Program Committee Member**, *International Joint Conference on Artificial Intelligence, IJCAI*.

2022 **Program Committee Member**, *Conference on Neural Information Processing Systems, NeurIPS*.

2023 **Reviewer**, *ACM-SIAM Symposium on Discrete Algorithms, SODA*.

2023 **Reviewer**, *ACM Symposium on Theory of Computing, STOC*.

International Journals

2023 **Reviewer**, *Transactions on Machine Learning Research, TMLR*.

2023 **Reviewer**, *Artificial Intelligence Journal, AIJ*.

2023 **Reviewer**, *Journal of Artificial Intelligence Research, JAIR*.

Students Supervision

MSc Students
- Giulia Landriani
- Giovanni Vignocchi
- Kevin Mussi
- Samuele Milanesi
- Edoardo Disarò
- Gabriele Aquaro
- Carlo Vitellio
- Francesco Bacchiocchi
- Federico Innocente
- Alberto Latino
- Luca Tombesi
- Francesca Colapenna
- Matteo Bollini
- Anna Lunghi

Teaching Activities

Online Learning Applications, Politecnico di Milano, Milan.
M.Sc. in Computer Science and Engineering.
Professor during the academic years 2022-2023, 2023-2024, 2024-2025

Informatica A, Politecnico di Milano, Milan.
B.Sc. in Engineering Physics.
Professor during the academic years 2024-2025.

Game Theory, Politecnico di Milano, Milan.
M.Sc. in Mathematical Engineering.
Teaching assistant during the academic years 2020-2021, 2021-2022.

Game Theory, Politecnico di Milano, Milan.
M.Sc. in Computer Science and Engineering.
Teaching assistant during the academic years 2019-2020.

Qualifications

TOEIC, Mark 940/990, Milan
Certificate of English language

Languages

Italian	Native	*Mother Tongue*
English	Fluent	*Daily practice, all work performed in English*

Autorizzo al trattamento dati ai sensi del GDPR 2016/679 del 27 aprile 2016 (Regolamento Europeo relativo alla protezione delle persone fisiche per quanto riguarda il trattamento dei dati personali). Autorizzo la pubblicazione del Curriculum Vitae sul sito istituzionale del Politecnico di Milano (sez. Amministrazione Trasparente) in ottemperanza al D. Lgs n. 33 del 14 marzo 2013 (e s.m.i.).