# Alberto Marchesi

# Curriculum Vitae et Studiorum

### Personal Information

Date of Birth September 22, 1992

Place of Birth Piacenza, Italy

Citinzenship Italian

### Work Information

University Politecnico di Milano

Department Dipartimento di Elettronica, Informazione e Bioingegneria (DEIB)

Address Via Golgi 39, 20133, Milano (MI), Italy

Email alberto.marchesi@polimi.it

Webpage albymarke.github.io Phone +39 02 2399 9685

# **Highlights**

Alberto Marchesi is an assistant professor (RTD-A) at the Department of Electronics, Information, and Bioenginnering of Politecnico di Milano, where he works in the Artificial Intelligence and Robotics Lab (AIRLAB). His reasearch focuses on algorithmic game theory and machine learning, with the aim of bridging the two fields to build artificial agents that are able to effectively take autonomus decisions in complex multi-agent scenarios. He got his PhD in Information Technology with laude from Politecnico di Milano, with a thesis on algorithmic game theory under the supervision of Prof. Nicola Gatti. His work as PhD student was awarded the 2020 Chorafas Award by the Dimitris N. Chorafas Foundation, while his PhD thesis received an honorable mention for the 2020 EurAl Dissertation Award. He is the author of more than 25 peer-reviewed research papers, including papers published in premier journals, such as Artificial Intelligence Journal (3), Algorithmica, and Games and Economic Behavior, and in top-tier international conferences, such as AAAI (7), IJCAI (5), NeurIPS (4), ICML, ACM EC, and AAMAS (2). One of his papers was awarded an "Outstanding Paper Award" at NeurIPS 2020, which is the most important annual gathering in the field of AI and machine learning (only 3 papers have been selected out of 9467 submissions). He serves as a program committee member for several top-tier confereces in Al and machine learning, and he is also guest associate editor for the Frontiers in Artificial Intelligence journal. He partecipated in several research and industrial projects as a research scientist, and, in 2020, he co-founded ML cube s.r.l., which is part of the spin-off program of Politecncio di Milano. He also taught several courses on computer science and AI, including BSc and MSc courses at Politecnico di Milano (as teaching assistant) and a PhD course on algorithmic game theory at Università di Bergamo (as lecturer).

# Experience

Assistant Professor (RTD-A), Politecnico di Milano, Dipartimento di Elettronica Informazione e Bioingegneria (DEIB), Milano.

Working in the Artificial Intelligence and Robotics Lab (AIRLAB).

2020

Co-founder & Al Specialist, ML cube s.r.l. – Polimi Spin-Off, Milano.

Involved in some projects at ML cube s.r.l., whose goal is providing cutting-edge solutions for machine learning systems and their life-cycle-management optimization.



Postdoc Research Assistant, Politecnico di Milano, Dipartimento di Elettronica Informazione e Bioingegneria (DEIB), Milano.

Working in the Artificial Intelligence and Robotics Lab (AIRLAB), within the research group lead by Prof. Nicola Gatti.

#### Education

2016 2020

PhD in Computer Science and Engineering, Politecnico di Milano, Milano.

Thesis: Leadership Games: Multiple Followers, Multiple Leaders, and Perfection.

Advisor: Prof. Nicola Gatti.

Mark: with laude.

2016

MSc in Computer Science and Engineering, Politecnico di Milano, Milano.

Thesis: Methods for finding Leader-Follower equilibria with multiple followers.

Advisor: Prof. Nicola Gatti. Mark: 110 cum laude/110.

2011 2014

BSc in Computer Science and Engineering, Politecnico di Milano, Milano.

Mark: 110 cum laude/110.

2011

Diploma di Perito Industriale in Informatica, Istituto Tecnico Industriale Statale

G. Marconi, Piacenza. Mark: 100 cum laude/100.

#### Research Interests

His research focuses on Artificial Intelligence, especially on Algorithmic Game Theory, Multi-agent Learning, and Online Learning.

- Algorithmic Analysis of the computational complexity of equilibirum finding problems.
- Game Theory Computing equilbiria in large imperfect-information sequential games.
  - Information structure design problems (a.k.a. algorithmic Bayesian persuasion).
  - Auctions, pricing, and mechanism design under the computational lense.
  - Computational analysis of principal-agent problems in contract theory.
  - Simulation-based games and their applications to complex real-world problems.

- Multi-agent Design of efficient no-regret learning dynamics converging to equilibria in games.
  - Learning Multi-agent reinforcement learning.

Online • Online learning techniques applied to classical algorithmic game theory problems.

- Learning Online convex optimization and its relation to learning dynamics in games.
  - Prediction with expert advice.
  - Best-arm identification problems.

# Summary

- Research Author of 7 journal papers, including 5 top-ranked Q1 journal papers (SCIMAGO).
  - Author of 23 papers on peer-reviewed international conferences, including 19 top-tier A++ conferences (CORE).
  - h-index 12 and 292 citations (Google Scholar, accessed: 03-24-2022).
  - Outstanding Paper Award at NeurIPS 2020.
  - Recipient of the 2020 Chorafas Award.
  - Honorable mention for the 2020 EurAl Dissertation Award.
  - PC member of three top-tier international conferences (NeurIPS, ICML, AAAI).
  - Senior PC memenber of a top-tier international conference (IJCAI).
  - Guest associate editor for the Frontiers in Artificial Intelligence journal.
  - o Internation collaborations with CMU, Columbia University, and University of Southampton.

- Teching Lecturer of a PhD-level course at *Università degli studi di Bergamo*.
  - Lecturer of an advanced course held for Ferrari s.p.a.
  - Teaching assistant of BSc and MSc courses at Politecnico di Milano for 4 years.

- Projects Reserach scientist for the PRIN 2017 ALGADIMAR reserach project.
  - Reserach scientist for three indutrial projects (DoveVivo s.p.a., Marina Militare, and Leonardo s.p.a.).

# Transfer

Technology • Co-founder of *Mlcube s.r.l.*, a spin-off of *Politecnico di Milano*.

#### Publications

#### Working Papers

Castiglioni M., Marchesi A., Gatti N.

Designing Menus of Contracts Efficiently: The Power of Randomization

ArXiv preprint, 2022, CoRR abs/2202.10966

Bacchiocchi F., Castiglioni M., Marchesi A., Romano G., Gatti N.

Public Signaling in Bayesian Ad Auctions

ArXiv preprint, 2022, CoRR abs/2201.09728

Farina G., Celli A., Marchesi A., Gatti N.

Simple Uncoupled No-Regret Learning Dynamics for Extensive-Form Correlated Equilibrium

ArXiv preprint, 2021, CoRR abs/2104.01520

### Papers on Proceedings of International Conferences

- [C1] 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 Multi-Agent Systems, AAMAS 2022, Virtual conference
- [C2] Castiglioni M., Romano G., Marchesi A., Gatti N.
  Signaling in Posted Price Auctions
  The 36th AAAI Conference on Artificial Intelligence, AAAI 2022, Virtual conference
- [C3] 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
- [C4] Bernasconi M., Cacciamani F., Fioravanti S., Gatti N., Marchesi A., Trovò F. Exploiting Opponents Under Utility Constraints in Sequential Games The 35th Conference on Neural Information Processing Systems, NeurIPS 2021, Virtual conference
- [C5] Castiglioni M., Marchesi A., Gatti N.
  Bayesian Agency: Linear versus Tractable Contracts
  The 22nd ACM Conference on Economics and Computation, EC 2021, Virtual conference
- [C6] Castiglioni M., Marchesi A., Celli A., Gatti N.
  Multi-Receiver Online Bayesian Persuasion
  The 38th International Conference on Machine Learning, ICML 2021, Virtual conference
- [C7] Celli A., Marchesi A., Farina G., Gatti N. Decentralized No-regret Learning Algorithms for Extensive-form Correlated Equilibria (Extended Abstract) The 30th International Joint Conference on Artificial Intelligence, IJCAI 2021, Virtual conference
- [C8] Romano G., Tartaglia G., Marchesi A., Gatti N.
  Online Posted Pricing with Unknown Time-Discounted Valuations
  The 35th AAAI Conference on Artificial Intelligence, AAAI 2021, Virtual conference
- [C9] Marchesi A., Gatti N.
  Trembling-Hand Perfection and Correlation in Sequential Games
  The 35th AAAI Conference on Artificial Intelligence, AAAI 2021, Virtual conference
- [C10] 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

- [C11] Celli A., Marchesi A., Farina G., Gatti N.
  No-Regret Learning Dynamics for Extensive-Form Correlated Equilibrium
  The 34th Conference on Neural Information Processing Systems, NeurIPS 2020,
  Virtual conference [Best Paper Award, only 3 out of 9467 submissions; Invited at the Sister Conference Best Paper Track session at the 30th International Joint Conference on Artificial Intelligence, IJCAI 2021; Invited at the Highlights Beyond EC plenary session at the 22nd ACM Conference on Economics and Computation, EC 2021]
- [C12] Castiglioni M., Celli A., Marchesi A., Gatti N.
  Online Bayesian Persuasion
  The 34th Conference on Neural Information Processing Systems, NeurIPS 2020, Virtual conference [Spotlight presentation, top 2.96% of submissions]
- [C13] Marchesi A., Trovò F., Gatti N. Learning Probably Approximately Correct Maximin Strategies in Simulation-Based Games with Infinite Strategy Spaces The 19th International Conference on Autonomous Agents and Multi-Agent Systems, AAMAS 2020, Virtual conference
- [C14] Celli A., Marchesi A., Bianchi T., Gatti N.
  Learning to Correlate in Multi-Player General-Sum Sequential Games
  The 33rd Conference on Neural Information Processing Systems, NeurIPS 2019, Vancouver, Canada
- [C15] Castiglioni M., Marchesi A., Gatti N.
  Be a Leader or Become a Follower: The Strategy to Commit to with Multiple Leaders
  The 28th International Joint Conference on Artificial Intelligence, IJCAI 2019, Macao, China
- [C16] Marchesi A., Castiglioni M., Gatti N.
  Leadership in Congestion Games: Multiple User Classes and Non-Singleton Actions
  The 28th International Joint Conference on Artificial Intelligence, IJCAI 2019, Macao,
  China
- [C17] Marchesi A., Farina G., Kroer C., Gatti N., Sandholm T.
  Quasi-Perfect Stackelberg Equilibrium
  The 33rd AAAI Conference on Artificial Intelligence, AAAI 2019, Honolulu, USA
- [C18] Marchesi A., Coniglio S., Gatti N. Leadership in Singleton Congestion Games The 27th International Joint Conference on Artificial Intelligence, IJCAI 2018: 447-453, Stockholm, Sweden
- [C19] Farina G., Marchesi A., Kroer C., Gatti N., Sandholm T. Trembling-Hand Perfection in Extensive-Form Games with Commitment The 27th International Joint Conference on Artificial Intelligence, IJCAI 2018: 233-239, Stockholm, Sweden
- [C20] De Nittis G., Marchesi A., Gatti N.
  Computing the Strategy to Commit to in Polymatrix Games
  The 32nd AAAI Conference on Artificial Intelligence, AAAI 2018: 989-996, New Orleans, USA

- [C21] Coniglio S., Gatti N., Marchesi A.
   Pessimistic Leader-Follower Equilibria with Multiple Followers
   The 26th International Joint Conference on Artificial Intelligence, IJCAI 2017: 171-177, Melbourne, Australia
- [C22] Celli A., Marchesi A., Gatti N.
  On the Complexity of Nash Equilibrium Reoptimization
  The 33rd Conference on Uncertainty in Artificial Intelligence, UAI 2017: 292-301,
  Sydney, Australia
- [C23] Basilico N., Coniglio S., Gatti N., Marchesi A.
  Bilevel programming approaches to the computation of optimistic and pessimistic single-leader-multi-follower equilibria
  The 16th International Symposium on Experimental Algorithms, SEA 2017: 31:1-31:14 London, UK, June 21-23, 2017

#### International Journals

- [J1] Castiglioni M., Marchesi A., Gatti N.

  Bayesian Agency: Linear versus Tractable Contracts

  Artificial Intelligence Journal (AIJ), 2022
- [J2] Castiglioni M., Marchesi A., Gatti N. Committing to correlated strategies with multiple leaders Artificial Intelligence Journal (AIJ), 2021
- [J3] Gatti N., Gilli M., Marchesi A.

  A Characterization of Quasi-Perfect Equilibria
  Games and Economic Behavior, 2020
- [J4] Coniglio S., Gatti N., Marchesi A.

  Computing a Pessimistic Stackelberg Equilibrium with Multiple Followers: the Mixed-Pure Case

  Algorithmica, 2020
- [J5] Castiglioni M., Marchesi A., Gatti N., Coniglio S.

  Leadership in Singleton Congestion Games: What is Hard and What is Easy
  Artificial Intelligence Journal (AIJ), 2019
- [J6] Basilico N., Coniglio S., Gatti N., Marchesi A.
  Bilevel programming methods for computing single-leader-multi-follower equilibria in normal-form and polymatrix games
  EURO Journal on Computational Optimization, 2019
- [J7] Celli A., Marchesi A.

  Learning Dynamics in Limited-Control Repeated Games
  Intelligenza Artificiale, 2018

#### Papers in International Workshops

[W1] Bernasconi M., Cacciamani F., Fioravanti S., Gatti N., Marchesi A., Trovò F. Exploiting Opponents under Utility Constraints in Extensive-Form Games AAAI-22 Workshop on Reinforcement Learning in Games, Virtual workshop

- [W2] Castiglioni M., Celli A., Marchesi A., Gatti N.
  Bayesian Persuasion in Online Setting
  AAAI-21 Workshop on Reinforcement Learning in Games, Virtual workshop
- [W3] Marchesi A., Trovò F., Gatti N.
  Learning Probably Approximately Correct Maximin Strategies in Games with Infinite Strategy Spaces
  AAAI-21 Workshop on Reinforcement Learning in Games, Virtual workshop
- [W4] Celli A., Marchesi A., Farina G., Gatti N.
  No-Regret Learning Dynamics for Extensive-Form Correlated Equilibrium
  Cooperative Al Workshop (NeurIPS 2020), Virtual workshop
- [W5] Castiglioni M., Marchesi A., Gatti N.
  Computing Correlated Strategies to Commit to with Multiple Leaders
  Games, Agents and Incentives Workshops at AAMAS 2020, Virtual workshop
- [W6] Marchesi A., Trovò F., Gatti N.
  Learning Maximin Strategies with Best Arm Identification Techniques
  Games, Agents and Incentives Workshops at AAMAS 2020, Virtual workshop
- [W7] Celli A., Marchesi A., Bianchi T., Gatti N. Learning to Correlate in Multi-Player General-Sum Sequential Games Smooth Games Optimization and Machine Learning Workshop (NeurIPS 2019), Vancouver, Canada.
- [W8] Marchesi A., Trovò F., Gatti N. Learning Maximin Strategies in Simulation-Based Games with Infinite Strategy Spaces Smooth Games Optimization and Machine Learning Workshop (NeurIPS 2019), Vancouver, Canada.
- [W9] Farina G., Marchesi A., Kroer C., Gatti N., Sandholm T.
  Trembling-Hand Perfection in Stackelberg Sequential Games
  Games, Agents and Incentives Workshops at AAMAS 2019, Montreal, Canada
- [W10] Marchesi A., Farina G., Kroer C., Gatti N., Sandholm T.
  Computing a Quasi-Perfect Stackelberg Equilibrium
  Games, Agents and Incentives Workshops at AAMAS 2019, Montreal, Canada
- [W11] Marchesi A., Coniglio S., Gatti N.
  Singleton Congestion Games with Leadership
  Games, Agents and Incentives Workshops at AAMAS 2019, Montreal, Canada
- [W12] Marchesi A., Farina G., Kroer C., Gatti N., Sandholm T.
  Quasi-Perfect Stackelberg Equilibrium
  AAAI-19 Workshop on Reinforcement Learning in Games, Honolulu, USA
- [W13] Celli A., Marchesi A.
  Nash Equilibrium Reoptimization is Hard
  The 3rd IJCAI Algorithmic Game Theory Workshop, Melbourne, Australia

**Awards** 

Paper Awards

#### **NeurIPS 2020 Outstanding Paper Award**

The paper "No-Regret Learning Dynamics for Extensive-Form Correlated Equilibrium" has been selected as one of the best **3** papers out of **9467** submissions.

#### Personal Awards

#### Honorable mention for the 2020 EurAl Dissertation Award

Prize awarded by the European Association for Artificial Intelligence to the best PhD thesis on aritificial intelligence among those of students in european institutions.

#### 2020 Chorafas Award

Prize awarded by the Dimitris N. Chorafas Foundation to the best doctoral student(s) in the Hard Sciences in each partner university.

#### **National Doctoral Scholarship**

Doctoral scholarship for three years, sponsored by the italian Ministry of Education, Universities and Research.

#### Borsa di Studio FCA e CNH Industrial 2017

Scolarships for the best graduated students (Laurea Magistrale) who are sons/daughters of emplyees of FCA and CNH Industrial.

#### Borsa di Studio FCA e CNH Industrial 2015

Scolarships for the best graduated students (Laurea Triennale) who are sons/daughters of emplyees of FCA and CNH Industrial.

# **Teaching**

### Courses with a Primary Responsibility

2020

Algorithmic Game Theory, Università degli studi di Bergamo, Bergamo.

- Role: Lecturer (with Prof. Nicola Gatti).
- Academic Year: 2020-2021 (10 hours).
- Description: Lectures for the the students of the PhD program in Computer Science.

2019

**Algorithmic Game Theory**, *Ferrari s.p.a.*, Maranello.

- Role: Lecturer (with Prof. Nicola Gatti and Dr. Andrea Celli; 25 hours in total).
- **Description:** Course on algorithmic game theory for the employees of Scuderia Ferrari.

#### **Teaching Assistant Activities**

2018

**Economics and Computation**, *Politecnico di Milano*, Milano.

- Role: Teaching assistant.
- Academic Years: 2017-2018 (14 hours); 2018-2019 (14 hours); 2019-2020 (24 hours);
   2020-2021 (24 hours); 2021-2022 (24 hours).
- Description: Exercise sessions using innovative teaching methodologies for students of the MSc in Computer Science Engineering and the MSc in Mathematical Engineering.

2018

Informatica A, Politecnico di Milano, Milano.

- Role: Teaching assistant.
- Academic Years: 2018-2019 (20 hours); 2019-2020 (20 hours); 2020-2021 (51 hours);
   2021-2022 (51 hours).
- **Description:** Exercise sessions for students of the BSc in Mathematical Engineering.



Game Theory, Politecnico di Milano, Milano.

- Role: Teaching assistant.
- Academic Year: 2019-2020 (15 hours).
- Description: Exercise sessions for students of the MSc in Mathematical Engineering.



## Industrial and Research Projects



Machine Learning per l'Autonomia dei Velivoli, Leonardo s.p.a., Italy.

- Role: Research Scientist.
- Description: Industrial project with the aim of developing ML-based systems for autonomous mission and fleet management.



PRIN 2017 ALGADIMAR, Ministry of Education, Universities and Research, Italy.

- Role: Research Scientist.
- Description: Research project focused on the development of new methods and tools in areas that are critical to the understanding of digital markets: algorithmic game theory, market/mechanism design, machine learning, algorithmic data analysis, and optimization in strategic settings.



RentMatic, DoveVivo s.p.a., Italy.

- Role: Research Scientist.
- Description: Industrial project with the aim of developing Al-based pricing algorithms for a room rental website.



**RocketAvoid**, Analisi&Valore s.r.l. and Marina Militare, Italy.

- Role: Research Scientist.
- Description: Industrial project with the aim of developing Al algorithms managing counter-missile defensive strategies for military ships.

#### Talks and Seminars

Talks given at International Conferences

Jul. 2021 Multi-Receiver Online Bayesian Persuasion

The 38th International Conference on Machine Learning, ICML 2021, Virtual

- Feb. 2021 Trembling-Hand Perfection and Correlation in Sequential Games The 35th AAAI Conference on Artificial Intelligence, AAAI 2021, Virtual
- Dec. 2020 No-Regret Learning Dynamics for Extensive-Form Correlated Equilibrium The 34th Conference on Neural Information Processing Systems, NeurIPS 2020, Virtual
- Aug. 2019 Be a Leader or Become a Follower: The Strategy to Commit to with Multiple Leaders

The 28th International Joint Conference on Artificial Intelligence, IJCAI 2019, Macao, China

Feb. 2018 Computing the Strategy to Commit to in Polymatrix Games

The 32nd AAAI Conference on Artificial Intelligence, AAAI 2018, New Orleans, USA

Aug. 2017 Pessimistic Leader-Follower Equilibria with Multiple Followers

The 26th International Joint Conference on Artificial Intelligence, IJCAI 2017, Melbourne, Australia

	Talks given at International Workshops
Dec. 2020	No-Regret Learning Dynamics for Extensive-Form Correlated Equilibrium Algadimar Annual Meeting 2020, Virtual
Aug. 2019	Be a Leader or Become a Follower: The Strategy to Commit to with Multiple Leaders
	Markets, Algorithms, Prediction, and LEarning 2019, MAPLE 2019, Milan, Italy
Aug. 2017	Nash Equilibrium Reoptimization is Hard The 3rd IJCAI Algorithmic Game Theory Workshop, Melbourne, Australia
	Seminars
Jan. 2018	When Are Equilibria of Simple Auctions Near-Optimal?  Permanent Itinerant Game Theory Seminars (P.I.G.S.), Politecnico di Milano, Italy
Mar. 2017	Leadership Games
	Permanent Itinerant Game Theory Seminars (P.I.G.S.), Politecnico di Milano, Italy
	Editorial Activities
	Editorial Activities
	International Journals
2020	Guest Associate Editor, Frontiers in Artificial Intelligence.
	International Conferences
2021	<b>Senior Program Committee Member</b> , <i>International Joint Conference on Artificial Intelligence</i> .
2021	Program Committee Member, International Conference on Machine Learning.
2020	Program Committee Member, Conference on Neural Information Processing

Program Committee Member, International Joint Conference on Artificial

Program Committee Member, AAAI Conference on Artificial Intelligence.

Students Supervision

Intelligence.

- MSc Sudents Matteo Castiglioni (now a PhD student at Politecnico di Milano)
  - o Tommaso Bianchi (Honours Programme Scientific Research in IT)
  - Jacopo Pio Gargano (Honours Programme Scientific Research in IT)
  - Francesco Bacchiocchi
  - Federica Gianotti
  - Giordano Colombi
  - Gianluca Tartaglia
  - Federico Cini
  - Niccolo Raspa
  - Gabriele Aquaro
  - Federico Maggi
  - Edoardo Disarò
  - Lorenzo Casalini
  - Emanuele Ricciardelli

# Qualifications



**TOEIC**, Mark 980/990, Milano.

Certificate of English language

# Languages

Italian Native

Mother Tongue

English Fluent

Daily practice, all work performed in English

# Internships



Web Application Programmer, H&S - Qualità nel software, Piacenza (PC), Italy. Development of a web application in ASP.NET and C#, management of databases in SQL Server 2008 Professional.

#### Skills

#### General

Social Good ability to adapt to multicultural environments, good communication skills.

Organisational Team spirit, team coordination.

Technical MS Office tools.

#### **Programming**

Languages C, Java, Python (numpy, scipy), R, MATLAB, AMPL, SQL, HTML, C#, Scheme,

Haskell, Prolog

IDEs Pycharm, Eclipse, NetBeans, MATLAB, R

Typesetting Microsoft Office, Apple iWork, LaTeX

Operating Microsoft Windows, Apple MacOS, GNU/Linux

Systems

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.).