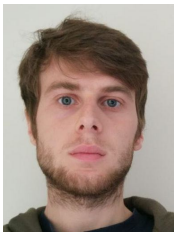
Matteo Castiglioni

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

Education

2018 – 2020 **PhD in Computer Science and Engineering**, *Politecnico di Milano*, Milano,
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*

2013 **Diploma ad indirizzo scientifico**, *Liceo Scientifico F. Bentivoglio*, Tradate (VA).
Mark *84/100*

Research Interests

My current research focuses on *Artificial Intelligence*, especially Algorithmic Game Theory, Social Influence and Computational Complexity

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Algorithmic Game Theory I am intrested in the computational complexity of finding equilibria, and the development of efficient algorithm to compute equilibria. In particular, my research focuses on Leader-follower games and signaling games.

Social Influence I am intrested in the study of the diffusion of information in social networks, the development of algorithms to maximize the influence and their computational complexity. My research focuses on the study of social influence and election manipulation.

PhD research project

Title *Election Control through Social Influence*

Advisors Prof. Nicola Gatti

Description In many of the recent political elections around the world, there has been evidence of the impact that false or incomplete news influenced the electoral outcome. My objective is studying how a malicius agent can change the result of an election spreading informations. In particular, we ask whether a manipulator can alter the outcome of the election controlling the spreading of information (e.g., fake news) in a social network. As a second case of study, we analize how should an agent disclose informations to win the elections.

Master thesis

Title *Leadership in singleton congestion games : what is hard and what is easy*

Supervisors Prof. Nicola Gatti

Description We study the problem of computing Stackelberg equilibria in congestion games, focusing on the case where each player can choose a single resource (a.k.a. singleton congestion games) and one of them acts as leader. In par- ticular, we address the cases where the players either have the same action spaces (i.e., the set of resources they can choose is the same for all of them) or different ones, and where their costs are either monotonic functions of the resource congestion or not. We show that, in the case where the players have different action spaces, the cost the leader incurs in a Stackelberg equilibrium cannot be approxi- mated in polynomial time up to within any polynomial factor in the size of the game unless P = NP, independently of the cost functions being mono- tonic or not. We show that a similar result also holds when the players have nonmonotonic cost functions, even if their action spaces are the same. We also improve an algorithm for the computation of a socially optimal equi- librium in singleton congestion games with the same action spaces without leadership, and extend it to the computation of a Stackelberg equilibrium for the case where the leader is restricted to pure strategies. For the cases in which the problem of finding an equilibrium is hard, we show how, in the optimistic setting where the followers break ties in favor of the leader, the problem can be formulated via mixed-integer linear programming techniques, which computational experiments show to scale quite well.

Publications

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

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

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

Awards

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

Students Supervision

Giulia Landriani, with Election manipulation on social networks with messages on multiple candidates. M.Sc. in Mathematical Engineering, Politecnico di Milano, Italy

Giovanni Vignocchi, with persuading voters in district-based elections. M.Sc. in Computer Science and Engineering, Politecnico di Milano, Italy

Relevant Academic Courses

Economics and Computation, *Politecnico di Milano*
Internet Economics, *Politecnico di Milano*
Game Theory, *Politecnico di Milano*
Autonomous Agents and Multiagent Systems, *Politecnico di Milano*
Artificial Intelligence, *Politecnico di Milano*
Machine Learning, *Politecnico di Milano*
Soft Computing, *Politecnico di Milano*
Data Mining and Text Mining, *Politecnico di Milano*
Knowledge Engineering, *Politecnico di Milano*
Foundations of Operations Research, *Politecnico di Milano*

Qualifications

2016

TOEIC, *Mark 940/990*, Milano.
Certificate of English language

Languages

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

Skills

Programming Languages	Python, Java, C, Matlab, Ampl

Personal Interests

Sport	Basket

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.).