Andrea Loreggia

Curriculum Vitae

Education

2013–2016 **PhD in Computer Science**, *University of Padova - Italy*, Doctoral School in Mathematical Sciences.
Thesis: *"Iterative Voting, Control and Sentiment Analysis"*.
Supervisor: prof. Francesca Rossi

2010–2012 **Master of Computer Science**, *University of Padova - Italy*, Department of Mathematics, 110/110 Cum Laude.
Thesis: *"Iterative voting and multi-mode control in preference aggregation"*.
Supervisors: prof. Francesca Rossi and prof. Piotr Faliszewski

2006–2010 **Bachelor of Computer Science**, *University of Padova - Italy*, Department of Mathematics.
Thesis: *"Simulations, Validation and Optimization of experimental clinical design: integration and software development"*.
Supervisors: prof. Tullio Vardanega and Mattia Veronese

Working Experiences

2020 - Today **Research Associate**, European University Institute, Firenze.
ERC Project Compulaw.

2016 - 2019 **Postdoc**, University of Padova, Padova.
I'm involved in the project "Safety constraints and ethical principles in collective decision making systems". The aim of the project is to study new formalisms of knowledge representation to model and reason with ethical principles in artificial agents. The research is exploring the use of deep learning techniques that combined with logical reasoning can approximate distance functions in metric spaces of structured preferences. We are designing and implementing experimental evaluations of the proposed models.

2014 - 2020 **Partner and CFO**, Istituto Galileo Ferraris srl, Padova.
Human resources management and supplier relationship management. With duties for planning and developing new curricula for improving the learning approach and the students' experience. National results at the Robocups Junior, Young Business Talent.

2005 - 2016 **Teacher**, Istituto Galileo Ferraris srl, Padova.
High school teacher for "Computer Science" and "Programming Languages".

2015 **Intern**, IBM Research, Yorktown Heights - New York - USA.
5 months visiting research under the supervision of Murray Campbell and Vijay Saraswat. During the internship, I studied and developed a new approach for automating the feature generation phase in supervised classification tasks, in particular in the area of algorithm portfolios. The proposed approach uses a deep learning technique based on convolutional neural networks. The results of the research were published at AAAI 2016 and patented by IBM in 2017.

2013 **Visiting PhD student**, NICTA, Sydney - Australia.
3 months visiting research under the supervision of prof. Toby Walsh. During the visit, I studied and developed new models useful to represent strategic actions (like manipulation or control) in voting systems. I also implemented several experimental evaluations of the proposed models. Experiments were focused on generating voting systems using different probabilistic models like the Polya-Eggenberger urn model or the impartial culture model.

2003 - 2005 **Network Security Consultant**, Primeur, Padova.
IT Security Project Manager for several IT Security projects like Firewall Consolidation, planning, Network Security Infrastructure implementation and delivering, reverse proxy, mail relay, IDS, LDAP infrastructure for centralize authentication.

1999 - 2003 **Network Security Consultant**, Internet Security Systems (ISS), Padova.
IT Security Project Manager for several IT Security projects like firewall consolidation; planning, Network Security Infrastructure implementation and delivering; vulnerability assessment; ethical hacking.

Publications

Book Chapters

2020 Andrea Loreggia, Nicholas Mattei, Francesca Rossi, K. Brent Venable. **Modeling and Reasoning with Preferences and Ethical Priorities in AI Systems**, to appear in The Ethics of Artificial Intelligence, Oxford University Press, S. Matthew Liao ed., 2019.

2018 A. Loreggia, N. Mattei, F. Rossi, and K. B. Venable. 2018. **Value Alignment Via Tractable Preference Distance.** In Artificial Intelligence Safety and Security, R. V. Yampolskiy (Ed.). CRC Press.

Refereed Journal Publications

2019 Andrea Loreggia, Nicholas Mattei, Francesca Rossi, and K. Brent Venable. **CPMetric: Deep Siamese Networks for Metric Learning on Structured Preferences**. In: El Fallah Seghrouchni A., Sarne D. (eds) Artificial Intelligence. IJCAI 2019 International Workshops. IJCAI 2019. Lecture Notes in Computer Science, vol 12158. Springer, Cham. https://doi.org/10.1007/978-3-030-56150-5_11

2019 Stefano Quintarelli, Francesco Corea, Fabio Fossa, Andrea Loreggia, Salvatore Sapienza. **AI: profili etici. Una prospettiva etica sull'Intelligenza Artificiale: princìpi, diritti e raccomandazioni**. BioLaw Journal, vol. 3 (2019), p. 183-204, ISSN 2284-4503.

2015 Umberto Grandi, Loreggia A, Francesca Rossi, Vijay A. Saraswat. **A Borda count for collective sentiment analysis.** ANNALS OF MATHEMATICS AND ARTIFICIAL INTELLIGENCE, vol. 77, p. 281-302, ISSN: 1573-7470, doi: 10.1007/s10472-015-9488-0.

2014 Andrea Loreggia. **Iterative voting and multi-mode control in preference aggregation.** Intelligenza Articiale 8 (2014) 3951. DOI 10.3233/IA-140059. IOS Press

Conference Proceedings

2020 Cornelio, Cristina, Michele Donini, Andrea Loreggia, Maria Silvia Pini, and Francesca Rossi. **Voting with Random Classifiers (VORACE).** In Proceedings of the 19th International Conference on Autonomous Agents and MultiAgent Systems, pp. 1822-1824. 2020.

2019 Andrea Loreggia, Nicholas Mattei, Francesca Rossi and Kristen Brent Venable. 2019. **Metric Learning for Value Alignment.** To appear in Proc. of the 1st IJCAI-19 Workshop on Artificial Intelligence Safety.

2019 Francesca Rossi and Andrea Loreggia. 2019. **Preferences and Ethical Priorities: Thinking Fast and Slow in AI.** To appear in Proc. of the 18th International Conference on Autonomous Agents and Multiagent Systems (AAMAS 2019)

2018 Michele Donini, Andrea Loreggia, Maria Silvia Pini, Francesca Rossi. **Voting with Random Neural Networks: a Democratic Ensemble Classifier.** RiCeRcA Workshop co-located with the 17th International Conference of the Italian Association for Artificial Intelligence, RiCeRcA@Ai*iA 2018

2018 Andrea Loreggia, Nicholas Mattei, Francesca Rossi and Kristen Brent Venable. **On the Distance Between CP-nets.** 17th International Conference on Autonomous Agents and Multiagent Systems (AAMAS 2018)

2018 Andrea Loreggia, Nicholas Mattei, Francesca Rossi and Kristen Brent Venable. **Preferences and Ethical Principles in Decision Making.** 1st AAAI-ACM Conference on Artificial Intelligence, Ethics and Society (AIES 2018)

2018 Andrea Loreggia, Nicholas Mattei, Francesca Rossi and Kristen Brent Venable. **A Notion of Distance Between CP-nets.** AAAI - 11th Multidisciplinary Workshop on Advances in Preference Handling (M-PREF18)

2017 Andrea Loreggia, Nicholas Mattei, Francesca Rossi and Kristen Brent Venable. **A Notion of Distance Between CP-nets.** 26th International Joint Conference on Artificial Intelligence: Fifth International Workshop on Graph Structures for Knowledge Representation and Reasoning (GKR 2017)

2017 Andrea Lorreggia, Francesca Rossi, Kristen Brent Venable. **Modeling Ethical Theories Compactly.** 31th AAAI Conference on Artificial Intelligence: 3rd International Workshop on AI, Ethics and Society

2016 Andrea Lorreggia, Horst Samulowitz, Yuri Malitsky, Vijay Saraswat. **Deep Learning for Algorithm Portfolios.** 30th AAAI Conference on Artificial Intelligence

2015 Andrea Loreggia, Nina Narodytska, Francesca Rossi, K. Brent Venable, Toby Walsh. **Controlling Elections by Replacing Candidates or Votes.** 14th International Conference on Autonomous Agents and Multiagent Systems

2014 Umberto Grandi, Andrea Loreggia, Francesca Rossi, Vijay Saraswat. **From Sentiment Analysis to Preference Aggregation.** ISAIM 2014 special session on computational social choice

2013 Umberto Grandi, Andrea Loreggia, Francesca Rossi, Kristen Brent Venable and Toby Walsh. **Restricted Manipulation in Iterative Voting: Condorcet Efficiency and Borda Score.** In Proceedings of the 3rd International Conference on Algorithmic Decision Theory, November 2013

2013 Umberto Grandi, Andrea Loreggia, Francesca Rossi, Kristen Brent Venable and Toby Walsh. **Restricted Manipulation in Iterative Voting: Condorcet Efficiency and Borda Score.** In Proceedings of the 7th Multidisciplinary Workshop on Advances in Preference Handling, August 2013

2013 Mattia Veronese, Stefano Zamuner, Andrea Loreggia, Alessandra Bertoldo. **Aodware: a model-based application for optimal and adaptive optimal experimental design exploration.** American Conference on Pharmacometrics2013. Ft.Lauderdale, Florida.(poster presentation)

International Schools

2019 **Dagstuhl Seminar 19381**, *"Application-Oriented Computational Social Choice"*, Dagstuhl, Germany.

Centre for Advanced Studies, Joint Research Centre, European Commission, *"HUMAINT Winter school on AI and its ethical, legal, social and economic (ELSE) impact"*, Sevilla, Spain.

Co-Located with AAAI-19 - Kilauea volcanic site, Hawaii County Emergency Response Facilities, and University of Hawaii Hilo, *"Artificial Intelligence for Natural Disasters"*, Hawaii, USA.

2017 **Dagstuhl Seminar 17261**, *"Voting: Beyond Simple Majorities and Single-Winner Elections"*, Dagstuhl, Germany.

2014 **Caen Summer School**, *"Interdisciplinary Analysis of Voting Rules"*, Caen, France.

Eisenhardt Castle in Bad Belzig, *"Workshop on Challenges in Algorithmic Social Choice"*, Bad Belzig, Germany.

2013 **Lipari International Summer School**, *"Computational Social Science: Big Data"*, Lipari, Italy.

Teaching

My teaching activity has been carried out in the areas of Fundamentals of Computer Science and Artificial Intelligence. I have taught courses for the Undergraduate Curriculum in Computer Science at University of Padova, and for the Undergraduate Curriculum in Computer Engineering at University of Padova, and the Graduate Curriculum in Computer Science of University of Padova. Below I give a detailed list of the courses I have been involved with, organized in academic years.

2020-2021 **Fall Semester**

Professor - Introductory Computer Science (9 CFU), *Undergraduate Curriculum in Product Innovation Engineering and Mechatronic Engineering*, University of Padova.

2019-2020 **Spring Semester**

Professor - Introduction to Artificial Intelligence (3 CFU), *Undergraduate Curriculum in Information Engineering*, University of Padova.

2019-2020 **Fall Semester**

Professor - Introductory Computer Science (9 CFU), *Undergraduate Curriculum in Product Innovation Engineering and Mechatronic Engineering*, University of Padova.

2018-2019 **Spring Semester**

Intelligent Systems, *Graduate Curriculum in Information Engineering*, University of Padova, Chair: prof. Maria Silvia Pini, Teaching assistant.

Professor - Introduction to Artificial Intelligence (3 CFU), *Undergraduate Curriculum in Information Engineering*, University of Padova.

2018-2019 **Fall Semester**

Assistant - Fundamentals of Computer science, *Undergraduate Curriculum in Engineering and management*, University of Padova, Chair: prof. Maria Silvia Pini.

2017-2018 **Spring Semester**

Assistant - Artificial Intelligence, *Graduate Curriculum in Computer Science*, University of Padova, Chair: prof. Maria Silvia Pini.

Assistant - Introduction to Artificial Intelligence, *Undergraduate Curriculum in Information Engineering*, University of Padova, Chair: prof. Silvana Badaloni.

2017-2018 **Fall Semester**

Assistant - Fundamentals of Computer science, *Undergraduate Curriculum in Engineering and management*, University of Padova, Chair: prof. Maria Silvia Pini.

Assistant - Fundamentals of Computer science, *Undergraduate Curriculum in Engineering and management*, University of Padova, Chair: prof. Giuseppe Satta.

2016-2017 **Assistant - Web Technologies**, *Undergraduate Curriculum in Computer Science*, University of Padova, Chair: prof. Ombretta Gaggi.

2012-2013 **Assistant - Computer Systems 1**, *Undergraduate Curriculum in Statistics for Economics and Business*, University of Padova, Chair: prof. Massimo Maresca.

2008-2009 **Assistant - Fundamentals of Computer science.**, *Undergraduate Curriculum in Computer Engineering.*, University of Padova, Chair: prof. Laura Bazzanella.

Activities

Member Member of the group of experts of UN/CEFACT - since 2020

Member of Board of the Doctoral School in AI Law and Technology, University of Bologna - since 2020

Member of the Admission Board of the Doctoral School in AI Law and Technology, University of Bologna - since 2020

Working group on "Artificial Intelligence and Ethics" at **Fondazione Leonardo - Civiltà delle Macchine.**

Invited speaker NeoForum 2020 - New Jersey - USA (cancelled due to COVID-19 restrictions)

	XIV Convegno dell'Associazione Italiana di Tecnologie Manifatturiere. Padova - Italy
	Invited mentor at SP-AIES 2019 - New Orleans - USA
Co-chair	International Forum on Digital and Democracy 2020.
	1st Workshop on Iterative Voting and Voting Games 2014.
	AI*IA 2014 Doctoral Consortium.
PC-member	AAAI 2021, IJCAI 2021, IJCAI 2020, AAMAS 2020, AAAI 2020, AAMAS 2019, SP-AIES 2019, AIES 2019, AAAI 2019, ECAI2016, IJCAI 2015, AAAI-2015, AAAI-2014.
Sub-reviewer	AAMAS 2017, AAAI 2016, TARK 2015, PLDI 2014.
Reviewer	Annals of Mathematics and Artificial Intelligence NeuroComputing.
Volunteer	IJCAI-13 Student Volunteer Program in Beijing, China.
	IJCAI-11 Student Volunteer Program in Barcelona, Spain.

Talks

2020	**Voting with Random Classifiers**. Online presentation – AAMAS 2020
2019	**Towards a SAFE Artificial Intelligence**. Paris, France, Social Responsibility of Algorithms – SRA 2019
2018	**On the Distance Between CP-nets**. Stockholm, Sweden, AAMAS 2018
2018	**Preferences and Ethical Principles in Decision Making**. New Orleans - AIES 2018
2018	**A Notion of Distance Between CP-nets**. New Orleans - AAAI 2018
2017	**Knowledge Reasoning: Towards a Combined Approach for Explainable Decision Making**. IBM T.J.Watson, New York
2017	**Modeling Ethical Theories Compactly**. San Francisco - AAAI 2017
2016	**Deep Learning for Algorithm Portfolios**. Phoenix - AAAI 2016
2015	**Deep Learning for Algorithm Portfolios**. Yorktown Heights - IBM Research
2014	**From sentiment analysis to preference aggregation**. Bad Belzig - CASC 2014.
2014	**Controlling elections by replacing candidates for plurality and veto: theoretical and experimental results.** Paris - EXPLORE 2014
2014	**Beneficial Strategic Reasoning in Iterative Voting. 1st Workshop on Iterative Voting and Voting Games.** Padova
2013	**Iterative voting and multi-mode control in preference aggregation.** Torino - AI*IA 2013
2013	**Restricted Manipulation in Iterative Voting: Condorcet Efficiency and Borda Score.** Bruxelles - ADT 2013
2013	**Restricted Manipulation in Iterative Voting: Condorcet Efficiency and Borda score.** Beijing - MPREF 2013

2013 **Iterative voting and multi-mode control in preference aggregation.** Sydney - NICTA

Student Advising

A list of undergraduate students I have collaborated with and the topics that were jointly considered.

2019-2020 Laura Menotti, University of Padova - Department of Information Engineering. Title: **Ethics' role in the diffusion of AI systems .** Supervisor: Andrea Loreggia.

Pivato Sandy, University of Padova - Department of Information Engineering. Title: **Artificial Intelligence and Fake News: creation, spread and identification.** Supervisor: Andrea Loreggia.

Roberto Vicentini, University of Padova - Department of Information Engineering. Title: **Seismic vulnerability of existing masonry buildings: design and development of a web portal.** Supervisor: Andrea Loreggia.

2018-2019 Leonardo Scantamburlo, University of Padova - Department of Information Engineering. Title: **On the usage of neural networks for weather forecasting.** Supervisor: prof. Maria Silvia Pini.

2017-2018 Emanuele Maruzzi, University of Padova - Department of Information Engineering. **Sentiment Analysis: Application and state-of-the-art.** Supervisor: prof. Maria Silvia Pini.

Federico Anselmo Scremin, University of Padova - Department of Information Engineering. **A Neural Network for Human Activity Recognition.** Supervisor: prof. Maria Silvia Pini.

Attended Conferences

2019 **Social Responsibility of Algorithms – SRA 2019.** Paris, France.

2019 **The Ethics and Law of AI.** Parliament Committees Hall, Rome - Italy.

2019 **Thirty-third AAAI Conference on Artificial Intelligence.** Honolulu, Hawaii - USA.

2019 **Second AI Ethics and Society.** Honolulu, Hawaii - USA.

2018 **World Summit AI.** Gashouder, Amsterdam, Netherlands.

2018 **International Conference on Autonomous Agents and Multiagent Systems.** Stockholm, Sweden.

2018 **Thirty-second AAAI Conference on Artificial Intelligence.** New Orleans, Louisiana USA.

2017 **Thirty-first AAAI Conference on Artificial Intelligence.** San Francisco, California USA.

2016 **Thirtieth AAAI Conference on Artificial Intelligence.** Phoenix, Arizona USA.

2014 **Third Symposium of the Italian Association for Artificial Intelligence "Artificial Intelligence for Society and Economy"**. Pisa, Italy

2014 **Meeting of Cost Action IC1205 on Computational Social Choice**. Sibiu, Romania

2014 **Workshop on Challenges in Algorithmic Social Choice (CASC 2014)**. Bad Belzig, Germany

2014 **First Workshop on Exploring Beyond the Worst Case in Computational Social Choice (EXPLORE 2014)**. Paris, France

2014 **First Workshop on Iterative Voting and Voting Games**. Padova, Italy

2013 **Twelfth Conference of the Italian Association for Artificial Intelligence.** Turin, Italy

2013 **Third International Conference on Algorithmic Decision Theory**. Bruxelles, Belgium

2013 **Twenty-third International Conference on Artificial Intelligence.** Beijing, China

Awards

2019 Winner of Best Paper Award for *Metric Learning for Value Alignment* at the AISafety - IJCAI Workshop.

2014 National Award for "Best Thesis on Artificial Intelligence" of the Italian Association for Artificial Intelligence.

2010 Stage.it 2010 - Honorable mention of the judges for the "integration of knowledge and competences in research in complementary scientific areas".

Computer skills

Advanced JAVA, PYTHON, Keras, Deep Learning, PHP, C, C++, MATHLB, LATEX, HTML, Computer Hardware and Support

Personal Skills

Team Leading, Problem Solving

Languages

English **Intermediate B2** *Conversationally fluent*

Spanish **Basic** *Basic words and phrases only*

Patents

2017 **Deep learning for algorithm portfolios** *US 9547821 B1*

Le dichiarazioni rese nel presente curriculum sono da ritenersi rilasciate ai sensi degli artt. 46 e 47 del D.P.R. 445/2000. Inoltre esprime il proprio consenso affinché i dati forniti possano essere trattati nel rispetto degli artt. 13 e 14 del GDPR Regolamento UE 2016/679 per gli adempimenti connessi alla presente procedura.

Padova, 09/07/2020