

CURRICULUM VITAE

Filippo Bistaffa

July 2020

Contacts

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Academic Positions

- 08/2019 – ongoing **Postdoctoral Research Fellow**
Department of Multi-Agent Systems, IIA-CSIC, Barcelona, Spain
- 06/2017 – 06/2019 **Marie-Curie Fellow**
Department of Multi-Agent Systems, IIA-CSIC, Barcelona, Spain
- 01/2016 – 06/2017 **Postdoctoral Research Fellow**
Department of Computer Science, University of Verona, Verona, Italy

Short Bio

During my research career I have been focusing on the **multi-perspective study of Constraint Optimisation**, by **making strong contributions to the state-of-the-art** both on **theoretical** and **practical** aspects and by tackling **different real-world problem domains** (e.g., collective energy purchasing, ridesharing, team formation, high-performance computing). I received my Ph.D. (Doctor Europæus) in April 2016 at the University of Verona. The research work of my Ph.D. thesis has been published in **10** articles in some of the most prestigious venues of the AI community, both leading international peer-reviewed journals and top-level international conferences. As a result, in 2017 I was awarded with a **Marie Skłodowska-Curie Individual Fellowship**, the most competitive and prestigious post-doctoral fellowships at European level, which I spent at the IIA institute of the Spanish National Research Council (CSIC). As a Marie-Curie Fellow, I continued working on prominent real-world Collective Intelligence applications such as ridesharing and team formation, publishing **5** articles both in leading international journals and top-level international conferences. I am currently a Postdoctoral Research Fellow at the IIA-CSIC, in charge of designing and implementing optimisation solution techniques for collaborative transportation and logistics (co-loading) as part of the LOGISTAR project.

Indicators **Google Scholar:** Documents: 22, Citations: 243, h-index: 9, i10-index: 8
 Scopus: Documents: 19, Citations: 120, h-index: 6

Graduate Studies

- 04/2016 **Ph.D. (Doctor Europæus) Computer Science**, University of Verona
Thesis: Constraint Optimisation Techniques for Real-World Applications
Supervisor: Prof. Alessandro Farinelli
Special mention: Italian Association for AI (AI*IA) Young Doctors Award 2017
- 03/2012 **M.Sc. Engineering and Computer Science**, University of Verona
Thesis: Coalition Formation in the Energy Market with a Graphical Model Approach
Supervisor: Prof. Alessandro Farinelli
- 10/2009 **B.Sc. Computer Engineering**, University of Pavia
Thesis: Implementation of Network Lossy Links with Kernel Linux 2.6
Supervisor: Prof. Giuseppe Rossi

Participation in Research Projects

- 08/2019 – ongoing **Title:** Enhanced Data Management Techniques for Real Time Logistics Planning
Position: Postdoctoral Research Fellow, IIIA-CSIC, Barcelona, Spain
Funding: H2020 (5,000,000 euro)
- 06/2017 – 06/2019 **Title:** Collectiveware: Highly-parallel Algorithms for Collective Intelligence
Position: Marie-Curie Fellow, IIIA-CSIC, Barcelona, Spain
Supervisor: Prof. Juan A. Rodríguez-Aguilar
Funding: H2020-MSCA-IF-2016 (158,121 euro)
- 01/2016 – 06/2017 **Title:** Development of AI Techniques for Sustainable Commuting
Position: Postdoctoral Research Fellow, University of Verona, Italy
Funding: University of Verona (29,000 euro)

Fellowships & Awards

- **Marie Skłodowska-Curie Individual Fellowship** (H2020-MSCA-IF-2016)
13% funded proposals out of 832 under “Information Science and Engineering” descriptor
- **Juan de la Cierva Formacion** (FJC-2016, renounced due to incompatibility with MSCA fellowship)
1st place in “Computation and Information Technology Sciences” ranking
- Italian Association for AI (AI*IA) Young Doctors Award 2017, special mention for Ph.D. thesis
- Three NVIDIA hardware grants (2016, 2017, 2019, total value ~9000\$)

Technology Contributions

- **Filed Patent:** “*Procedure, system, computer program, and computer system to optimise the performance of online ridesharing*” (original title in Spanish: “*Procedimiento, sistema, programa informático, y sistema informático para optimizar el rendimiento de una red de compartición de viajes en línea*”)
Reference: P201930873 (Spanish patent request filed on the 8th of October 2019)
- **Notarial Registry:** “CoMe4Ride”: Large-Scale Online Ridesharing Optimisation Software
Reference: N° 3757/2019, (registered by CSIC on the 18th of October 2019)

Teaching Experience

- 1–5/07/2019 **Lecturer** – “Constrained Optimisation for Multi-Agent Systems”
Advanced Course on AI (ACAI) Summer School, Crete, Greece (90 attendees)
- 2013 – 2016 **Tutor** – “Algorithms (Programming Laboratory II)”
Bachelor Degree in Bioinformatics
University of Verona, Verona, Italy (~ 40 students/year)
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Supervised Students

- Since 2019 Adrià Fenoy (**Ph.D.**, supervised with Prof. Alessandro Farinelli)
Thesis: Deep Reinforcement Learning for Collective Intelligence Domains
Department of Multi-Agent Systems, IIIA-CSIC, Barcelona, Spain
Department of Computer Science, University of Verona, Verona, Italy
- 2019 Adrià Fenoy (**M.Sc.**, supervised with Prof. Juan A. Rodríguez-Aguilar)
Thesis: Improving Generative Adversarial Networks by Including Hard Constraints
Defense: 11/07/2019, Department of Mathematics, UAB, Barcelona, Spain
- 2019 Carlos Mougan Navarro (**M.Sc.**, supervised with Prof. Juan A. Rodríguez-Aguilar)
Thesis: Improvements on Generative Adversarial Networks with Hard Constraints
Defense: 11/07/2019, Department of Mathematics, UAB, Barcelona, Spain
- 2015 Francesco Donato (**M.Sc.**, supervised with Prof. Alessandro Farinelli)
Thesis: Forming Groups for Social Ridesharing with Time Constraints
Defense: 19/03/2015, Department of Computer Science, University of Verona, Verona, Italy
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Scientific Community Service

- Editor for “Collaborative Transportation” article collection (2020) in *Frontiers in Sustainable Cities* journal
- Reviewer for Marie Skłodowska-Curie Individual Fellowship proposals, since 2020
- Reviewer for international AI journals:
 - *Artificial Intelligence* (**Q1**), since 2017
 - *IEEE Transactions on Cybernetics* (**Q1**), since 2016
 - *Computers & Operations Research* (**Q1**), since 2018
 - *European Journal of Operational Research* (**Q1**), since 2019
 - *IEEE Transactions on Intelligent Transportation Systems* (**Q1**), since 2020
 - *ACM Transactions on Autonomous and Adaptive Systems* (**Q2**), since 2020
 - *Autonomous Agents and Multi-Agent Systems* (**Q3**), since 2018
- PC member for international AI conferences and workshops:
 - *AAAI Conference on Artificial Intelligence* (CORE **A***), since 2017
 - *International Conference on Autonomous Agents and Multi-Agent Systems* (CORE **A***), since 2019
 - *International Joint Conference Conference on Artificial Intelligence* (CORE **A***), since 2017
 - *European Conference on Artificial Intelligence* (CORE **A**), since 2018
 - *Genetic and Evolutionary Computation Conference* (CORE **A**), since 2019
 - *European Conference on Multi-Agent System* (CORE **C**), since 2019
 - *International Workshop on Optimisation in Multi-Agent Systems*, since 2013
 - *International Workshop on Teams in Multi-Agent Systems*, since 2017
- Board member for ACIA (Associació Catalana d’Intel·ligència Artificial) M.Sc. thesis award 2019

Invited Talks

- 25/10/2019 Constrained Optimisation for Collective Intelligence Applications
Department of Computer Science, Pompeu Fabra University, Barcelona, Spain
- 17/07/2019 Constrained Optimisation for Multi-Agent Systems
Department of Multi-Agent Systems, IIIA-CSIC, Barcelona, Spain
- 09/06/2017 Constraint Optimisation Techniques for Real-World Applications
Department of Computer Science, University of Verona, Verona, Italy
- 09/06/2015 Social Computing
Department of Computer Science, University of Verona, Verona, Italy
- 18/05/2015 Towards Optimal Solar Tracking
Department of Computer Science, University of Verona, Verona, Italy
- 12/03/2015 Coalition Formation for Multi-Agent Systems
ECS Department, University of Southampton, Southampton, UK
- 27/11/2014 Using GPGPUs to Speed-Up Computation: a Belief Propagation Example
ECS Department, University of Southampton, Southampton, UK
- 05/12/2013 Game Theory for Computer Science
Department of Computer Science, University of Verona, Verona, Italy

Major Collaborators

- Prof. Carles Sierra, Topic: AI Techniques for Education
Department of Multi-Agent Systems, IIIA-CSIC, Barcelona, Spain
- Prof. Juan A. Rodríguez-Aguilar, Topic: Constrained Optimisation for Collective Formation
Department of Multi-Agent Systems, IIIA-CSIC, Barcelona, Spain
- Prof. Alessandro Farinelli, Topic: Constrained Optimisation for Collective Formation
Department of Computer Science, University of Verona, Verona, Italy
- Prof. Sarvapali D. Ramchurn, Topic: Collective Formation for Social Ridesharing
ECS Department, University of Southampton, Southampton, United Kingdom
- Prof. Georgios Chalkiadakis, Topic: Cooperative Game Theory for Collective Formation
School of Electrical and Computer Engineering, Technical University of Crete, Crete, Greece
- Prof. Nicola Bombieri, Topic: Highly-Parallel Approaches for Constrained Optimisation
Department of Computer Science, University of Verona, Verona, Italy
- Dr. Jesús Cerquides, Topic: Constrained Optimisation for Collective Formation
Department of Multi-Agent Systems, IIIA-CSIC, Barcelona, Spain
- Dr. Christian Blum, Topic: Meta-Heuristic Approaches for Constrained Optimisation
Department of Multi-Agent Systems, IIIA-CSIC, Barcelona, Spain

Stays Abroad

- 06/2014 – 03/2015 ECS Department, University of Southampton, UK
- 06/2013 Department of Multi-Agent Systems, IIIA-CSIC, Barcelona, Spain

Publications Summary¹

- International AI journals: 8 articles
 - Q1: 7 articles
 - Q2: 1 article
- International AI conferences: 12 articles
 - CORE A*: 6 articles
 - CORE A: 1 article
- Percentage of publications with collaborators of external institutions: 65%

Journal Publications

- [1] **Filippo Bistaffa**, Christian Blum, Jesús Cerquides, Alessandro Farinelli, and Juan A. Rodríguez-Aguilar. A Computational Approach to Quantify the Benefits of Ridesharing for Policy Makers and Travellers. In *IEEE Transactions on Intelligent Transportation Systems* (IEEE T-ITS), in press (**Q1**, impact factor 2019: **6.319**). DOI: <https://dx.doi.org/10.1109/TITS.2019.2954982>.
- [2] Ewa Andrejczuk, **Filippo Bistaffa**, Christian Blum, Juan A. Rodríguez-Aguilar, and Carles Sierra. Synergistic Team Composition: A Computational Approach to Foster Diversity in Teams. In *Knowledge-Based Systems* (KBS), 2019 (**Q1**, impact factor: **5.921**). DOI: <https://dx.doi.org/10.1016/j.knosys.2019.06.007>.
- [3] **Filippo Bistaffa** and Alessandro Farinelli. A COP Model for Graph-Constrained Coalition Formation. In *Journal of Artificial Intelligence Research* (JAIR), 2018 (**Q2**, impact factor: **1.820**). DOI: <http://dx.doi.org/10.1613/jair.1.11205>.
- [4] **Filippo Bistaffa**, Georgios Chalkiadakis, Alessandro Farinelli, and Sarvapali D. Ramchurn. A Cooperative Game-Theoretic Approach to the Social Ridesharing Problem. In *Artificial Intelligence* (AIJ), 2017 (**Q1**, impact factor: **3.034**). DOI: <http://dx.doi.org/10.1016/j.artint.2017.02.004>.
- [5] **Filippo Bistaffa**, Alessandro Farinelli, Jesús Cerquides, Juan A. Rodríguez-Aguilar, and Sarvapali D. Ramchurn. Algorithms for Graph-Constrained Coalition Formation in the Real World. In *ACM Transactions on Intelligent Systems and Technology* (ACM TIST), 2017 (**Q1**, impact factor: **2.973**). DOI: <http://dx.doi.org/10.1145/3040967>.
- [6] **Filippo Bistaffa**, Nicola Bombieri, and Alessandro Farinelli. An Efficient Approach for Accelerating Bucket Elimination on GPUs. In *IEEE Transactions on Cybernetics* (IEEE CYB), 2017 (**Q1**, impact factor: **8.803**). DOI: <http://dx.doi.org/10.1109/TCYB.2016.2593773>.
- [7] Alessandro Farinelli, Manuele Bicego, **Filippo Bistaffa**, and Sarvapali D. Ramchurn. A Hierarchical Clustering Approach to Large-Scale Near-Optimal Coalition Formation with Quality Guarantees. In *Engineering Applications of Artificial Intelligence* (EAAI), 2017 (**Q1**, impact factor: **2.819**). DOI: <http://dx.doi.org/10.1016/j.engappai.2016.12.018>.
- [8] Michele Roncalli, **Filippo Bistaffa**, and Alessandro Farinelli. Decentralized Power Distribution in the Smart Grid with Ancillary Lines. In *Mobile Networks and Applications* (MONET), 2017 (**Q1**, impact factor: **2.497**). DOI: <http://dx.doi.org/10.1007/s11036-017-0893-y>.

¹Quartiles and impact factors according to Journal Citation Reports. For articles published later than 2019, most recent impact factor available from Journal Citation Reports (2019) is reported.

Peer-Reviewed Conference Publications

- [9] Ewa Andrejczuk, **Filippo Bistaffa**, Christian Blum, Juan A. Rodríguez-Aguilar, and Carles Sierra. Heterogeneous Teams for Homogeneous Performance. In *Conference on Principles and Practice of Multi-Agent Systems* (PRIMA), 2018 (CORE B). DOI: http://dx.doi.org/10.1007/978-3-030-03098-8_6.
- [10] **Filippo Bistaffa** and Alessandro Farinelli. A COP Model for Graph-Constrained Coalition Formation (Extended Abstract). In *International Joint Conference on Artificial Intelligence*, IJCAI, 2018 (CORE A*). DOI: <http://dx.doi.org/10.24963/ijcai.2018/783>.
- [11] Ewa Andrejczuk, **Filippo Bistaffa**, Christian Blum, Juan A. Rodríguez-Aguilar, and Carles Sierra. Solving the Synergistic Team Composition Problem (Extended Abstract). In *International Conference on Autonomous Agents and Multiagent Systems* (AAMAS), 2018 (CORE A*). URL: <https://dl.acm.org/citation.cfm?id=3238001>.
- [12] **Filippo Bistaffa**, Juan A. Rodríguez-Aguilar, Jesús Cerquides, and Christian Blum. A Simulation Tool for Large-Scale Online Ridesharing (Demonstration). In *International Conference on Autonomous Agents and Multiagent Systems* (AAMAS), 2018 (CORE A*). URL: <https://dl.acm.org/citation.cfm?id=3237981>.
- [13] **Filippo Bistaffa**, Nicola Bombieri, and Alessandro Farinelli. CUBE: A CUDA approach for Bucket Elimination on GPUs. In *European Conference on Artificial Intelligence* (ECAI), 2016 (CORE A). DOI: <http://dx.doi.org/10.3233/978-1-61499-672-9-125>.
- [14] **Filippo Bistaffa**, Georgios Chalkiadakis, Alessandro Farinelli, and Sarvapali D. Ramchurn. Recommending Fair Payments for Large-Scale Social Ridesharing. In *ACM Conference on Recommender Systems* (RecSys), 2015 (CORE B). DOI: <http://dx.doi.org/10.1145/2792838.2800177>.
- [15] **Filippo Bistaffa**, Alessandro Farinelli, and Sarvapali D. Ramchurn. Sharing Rides with Friends: a Coalition Formation Algorithm for Ridesharing. In *AAAI Conference on Artificial Intelligence* (AAAI), 2015 (CORE A*). URL: <http://www.aaai.org/ocs/index.php/AAAI/AAAI15/paper/view/9622>.
- [16] **Filippo Bistaffa**, Alessandro Farinelli, and Nicola Bombieri. Optimising Memory Management for Belief Propagation in Junction Trees Using GPGPUs. In *IEEE International Conference on Parallel and Distributed Systems* (ICPADS), 2014 (CORE B). DOI: <http://dx.doi.org/10.1109/padsw.2014.7097850>.
- [17] **Filippo Bistaffa**, Alessandro Farinelli, Jesús Cerquides, Juan A. Rodríguez-Aguilar, and Sarvapali D. Ramchurn. Anytime Coalition Structure Generation on Synergy Graphs. In *International Conference on Autonomous Agents and Multiagent Systems* (AAMAS), 2014 (CORE A*). URL: <https://dl.acm.org/citation.cfm?id=2615737>.
- [18] **Filippo Bistaffa** and Alessandro Farinelli. A Fast Approach to Form Core-Stable Coalitions Based on a Dynamic Model. In *IEEE/WIC/ACM International Joint Conferences on Web Intelligence and Intelligent Agent Technologies* (WI/IAT), 2013 (CORE B). DOI: <http://dx.doi.org/10.1109/WI-IAT.2013.100>.
- [19] **Filippo Bistaffa**, Alessandro Farinelli, Meritxell Vinyals, and Alex Rogers. Coalitional Energy Purchasing in the Smart Grid. In *IEEE International Energy Conference & Exhibition* (ENERGYCON), 2012. DOI: <http://dx.doi.org/10.1109/energycon.2012.6348270>.
- [20] **Filippo Bistaffa**, Alessandro Farinelli, Meritxell Vinyals, and Alex Rogers. Decentralised Stable Coalition Formation Among Energy Consumers in the Smart Grid (Demonstration). In *International Conference on Autonomous Agents and Multiagent Systems* (AAMAS), 2012 (CORE A*). URL: <https://dl.acm.org/citation.cfm?id=2344061>.

Peer-Reviewed Workshop Publications

- [21] Filippo Bistaffa, Alessandro Farinelli, Jesús Cerquides, Juan A. Rodríguez-Aguilar, and Sarvapali D. Ramchurn. Anytime Coalition Structure Generation on Scale-Free and Community Networks. In *International Joint Workshop on Optimisation in Multi-Agent Systems and Distributed Constraint Reasoning* (OPTMAS-DCR), 2014.
- [22] Filippo Bistaffa, Alessandro Farinelli, Meritxell Vinyals, and Alex Rogers. Stable Coalition Formation Among Energy Consumers in the Smart Grid. In *International Workshop on Agent Technologies for Energy Systems* (ATES), 2012.

Doctoral Consortium Publications

- [23] Filippo Bistaffa. Parallel Algorithms for Hard Combinatorial Optimisation Problems in Multi-Agent Systems. In *International Conference on Autonomous Agents and Multiagent Systems* (AAMAS), 2014 (CORE A*). URL: <https://dl.acm.org/citation.cfm?id=2616142>.