CURRICULUM VITAE

Filippo Bistaffa

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Contacts

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Academic Positions

08/2019 – ongoing **Postdoctoral Research Fellow**
Department of Multi-Agent Systems, IIIA-CSIC, Barcelona, Spain

06/2017 – 06/2019 **Marie-Curie Fellow**
Department of Multi-Agent Systems, IIIA-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 IIIA 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 IIIA-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: 256, h-index: 9, i10-index: 9
Scopus: Documents: 19, Citations: 128, 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.Eng. Computer Engineering**, University of Pavia
Thesis: Implementation of Network Lossy Links with Kernel Linux 2.6
Supervisor: Prof. Giuseppe Rossi

Participation in Research Projects

06/2020 – ongoing **Title:** Computational Intelligence for Sustainable Development Goals
Position: Postdoctoral Research Fellow, IIIA-CSIC, Barcelona, Spain
Funding: MICINN (102,850 euro)

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

- **Europa Investigación 2020 Grant** (Spanish State Research Agency, AEI)
  10,000 euro individually awarded for the preparation of an ERC Starting Grant proposal
- **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

- **Notarial Registry:** "CoMe4Ride": Large-Scale Online Ridesharing Optimisation Software
  Reference: Nº 3757/2019, (registered by CSIC on the 18th of October 2019)
- **Notarial Registry:** "SynTeam": Team Formation Optimisation for Cooperative Learning
  Reference: Nº 2301/2020, (registered by CSIC on the 29th of June 2020)

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 ($\sim$ 40 students/year)

Supervised Students

Since 2021	Camilo Chacón Sartori (**Ph.D.**, supervised with Dr. Christian Blum) Thesis: High-performance Combinatorial Optimisation for Sustainable Development Goals Department of Multi-Agent Systems, IIIA-CSIC, Barcelona, Spain
Since 2020	Roger Xavier Lera Leri (**M.Sc.**) Thesis: Combinatorial Optimisation Techniques for Matching Researchers to Projects Department of Multi-Agent Systems, IIIA-CSIC, Barcelona, Spain
Since 2019	Adrià Fenoy (**Ph.D.**, supervised with Prof. Alessandro Farinelli) Thesis: Combining Machine Learning Models with Classical Techniques for COPs Department of Multi-Agent Systems, IIIA-CSIC, Barcelona, Spain Department of Computer Science, University of Verona, Verona, Italy
2020	Oscar Diaz Durán (**M.Sc.**) Thesis: Studying the Benefit of Classical and DL Predictors on Ridesharing Optimisation Defence: 08/09/2020, Department of Mathematics, UAB, Barcelona, Spain
2019	Adrià Fenoy (**M.Sc.**, supervised with Prof. Juan A. Rodríguez-Aguilar) Thesis: Improving Generative Adversarial Networks by Including Hard Constraints Defence: 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 Defence: 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 Defence: 19/03/2015, Department of Computer Science, University of Verona, Verona, Italy

Scientific Community Service

- Reviewer for Marie Skłodowska-Curie Individual Fellowship proposals, since 2020
- Organiser of OptLearnMAS AAMAS workshop, since 2021
- Organiser of forthcoming IJCAI workshop on optimisation for multi-agent learning, since 2021
- Editor for "Collaborative Transportation" article collection (2020) in *Frontiers in Sustainable Cities* journal
- 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

- Senior PC member for *International Joint Conference Conference on AI* (CORE **A***), since 2021
- 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
  - *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

03/12/2020	Large-Scale P2P Ridesharing Department of Computer Science, Girona University, Girona, Spain
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

Publications Summary[1]

- International AI journals: 9 articles
  - Q1: 8 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**, Georgios Chalkiadakis, and Alessandro Farinelli. Efficient Coalition Structure Generation via Approximately Equivalent Induced Subgraph Games. In *IEEE Transactions on Cybernetics* (IEEE CYB), in press (**Q1**, impact factor 2019: **11.079**). DOI: `https://dx.doi.org/10.1109/TCYB.2020.3040622`.

[2] **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`.

[3] 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`.

[4] **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`.

[5] **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`.

[6] **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`.

[7] **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`.

[8] 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`.

[9] 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`.

[1] Quartiles 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

[10] 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 Multiagent Systems* (PRIMA), 2018 (CORE **B**). DOI: http://dx.doi.org/10.1007/978-3-030-03098-8_6.

[11] **Filippo Bistaffa** and Alessandro Farinelli. A COP Model for Graph-Constrained Coalition Formation (Extended Abstract). **Invited** in *International Joint Conference on Artificial Intelligence* (IJCAI), 2018 (CORE **A***). DOI: http://dx.doi.org/10.24963/ijcai.2018/783.

[12] 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.

[13] **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.

[14] **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.

[15] **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.

[16] **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.

[17] **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.

[18] **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.

[19] **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.

[20] **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.

[21] **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

[22] **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 Multiagent Systems and Distributed Constraint Reasoning* (OPTMAS-DCR), 2014.

[23] **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

[24] **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`.

Stays Abroad

06/2014 – 03/2015 ECS Department, University of Southampton, UK

06/2013 Department of Multi-Agent Systems, IIIA-CSIC, Barcelona, Spain