CURRICULUM VITAE

Filippo Bistaffa

December 2023

Contacts

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Academic Positions

12/2023 – ongoing	**Tenured Researcher** Department of Multi-Agent Systems, IIIA-CSIC, Barcelona, Spain
08/2019 – 11/2023	**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

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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 a **Marie Skłodowska-Curie Individual Fellowship**, the most competitive and prestigious postdoctoral fellowship at the 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 in leading international journals and top-level international conferences. I have recently concluded leading (as the **PI**) the AVI-IA project (privately funded by the ITBID S.L. company), which aims to implement an AI system that guides strategic decisions in purchasing processes by exploiting novel Constrained Optimisation techniques that I have developed. The resulting AI algorithms have been fully integrated into IT-BID's commercial product with a Technology Readiness Level of 7 (https://bit.ly/avi-ia). I am currently a **CSIC Tenured Researcher** (*Cientifico Titular*) leading (as the **PI**) the "YOMA Operational Research" project funded by the Botnar Foundation, whose objective is to recommend personalised learning pathways that maximise the acquisition of professional digital skills for young learners in Africa.

Indicators:	**Google Scholar:** Citations: 500, h-index: 12, i10-index: 15
	Scopus: Citations: 270, h-index: 9

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

10/2021 – 10/2022	**Title:** An AI-Based System to Support Purchasing Processes (AVI-IA) **Position:** Principal Investigator, IIIA-CSIC, Barcelona, Spain **Funding:** Private Contract with ITBID Company (119,500 euro)
06/2020 – 05/2023	**Title:** Computational Intelligence for Sustainable Development Goals (CI-SUSTAIN) **Position:** Postdoctoral Research Fellow, IIIA-CSIC, Barcelona, Spain **Funding:** MICINN (102,850 euro)
08/2019 – 09/2021	**Title:** Data Management Techniques for Real-Time Logistics Planning (LOGISTAR) **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 (HPA4CF) **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 (AI-SC) **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€ 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

Since 2022	**Lecturer** – "Tutorial on Multi-Agent Distributed Constrained Optimization" AAMAS 2023 (London, UK, 25 attendees), AAMAS 2022 (Online, 40 attendees)
4–9/07/2022	**Lecturer** – "Computational Sustainability in Multi-Agent Systems" AI-HUB Summer School, Palma de Mallorca, Spain (95 attendees)
19–23/07/2021	**Lecturer** – "Constrained Optimisation for Multi-Agent Systems" European Agent Systems Summer School (EASSS), Online (110 attendees)
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)" University of Verona, Verona, Italy ($\sim$40 students/year)

Supervised Students

Since 2021	Roger Xavier Lera Leri (**Ph.D.**) Thesis: Explainability for Optimisation-based Decision Support Systems Department of Multi-Agent Systems, IIIA-CSIC, Barcelona, Spain School Of Engineering, UAB, Barcelona, Spain
Since 2021	Camilo Chacón Sartori (**Ph.D.**, co-supervised with Dr. Christian Blum) Thesis: High-Performance Combinatorial Optimisation for Sustainable Development Goals Department of Multi-Agent Systems, IIIA-CSIC, Barcelona, Spain
2019 – 2023	Adrià Fenoy (**Ph.D.**, co-supervised with Prof. Alessandro Farinelli) Thesis: Combining Optimisation and Machine Learning for the Formation of Collectives Department of Computer Science, University of Verona, Verona, Italy Graduation Date: 28/08/2023
M.Sc.	6 students (1 in 2022 and 1 in 2021 funded by JAE Intro ICU, 1 in 2020, 2 in 2019, 1 in 2015)

Scientific Community Service

- Organiser of OptLearnMAS workshop at AAMAS conference (CORE **A***), since 2023

- 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
  - *Transportation Research: Part D* (**Q1**), since 2021
  - *ACM Transactions on Autonomous and Adaptive Systems* (**Q2**), since 2020

- Senior PC member for international AI conferences:

  - *International Joint Conference Conference on Artificial Intelligence* (CORE **A***), since 2021
  - *European Conference on Artificial Intelligence* (CORE **A**), since 2023

- PC member for international AI conferences:

  - *AAAI Conference on Artificial Intelligence* (CORE **A***), since 2017
  - *International Conference on Autonomous Agents and Multi-Agent Systems* (CORE **A***), since 2019
  - *Genetic and Evolutionary Computation Conference* (CORE **A**), since 2019
  - *European Conference on Multi-Agent System* (CORE **C**), since 2019

- Board member for ACIA (Associació Catalana d'Intel·ligència Artificial) M.Sc. thesis award 2019

Dissemination & Outreach Activities

13/07/2023	AI Techniques for Sustainable Shared Mobility (Barcelona Metropolis, Barcelona City Hall) Awarded by the ACIA the 2nd Prize for the Best Artificial Intelligence Dissemination Work
08/07/2022	Mathematical Education & Artificial Intelligence (Moderator, part of AI-HUB Summer School) CaixaForum, Palma de Mallorca, Spain (Online at `https://youtu.be/VlBjRm2XFZ8`)
09/12/2021	AI for Shared Mobility (Invited Talk, cycle "Urban Mobility" by Zaragoza's Ch. of Commerce) University of Zaragoza, Zaragoza, Spain
24/03/2021	AI for Shared Mobility (Invited Webinar, cycle "ITC & Mobility" by IberCaja Foundation) Online at `https://youtu.be/moSw77BKEYE`
03/12/2020	Large-Scale P2P Ridesharing (Invited Seminar) University of Girona, Girona, Spain
28/02/2020	Presentation of PTI Mobility 2030 (Invited Talk) ICB-CSIC, Zaragoza, Spain (Online at `https://youtu.be/9fii0vcmxwA`)
25/10/2019	Constrained Optimisation for Collective Intelligence Applications (Invited Seminar) Pompeu Fabra University, Barcelona, Spain
17/07/2019	Constrained Optimisation for Multi-Agent Systems (Departmental Seminar) IIIA-CSIC, Barcelona, Spain
09/06/2015	Social Computing (Departmental Seminar) University of Verona, Verona, Italy
18/05/2015	Towards Optimal Solar Tracking (Departmental Seminar) University of Verona, Verona, Italy
12/03/2015	Coalition Formation for Multi-Agent Systems (Departmental Seminar) University of Southampton, Southampton, UK
27/11/2014	Using GPGPUs to Speed-Up the Computation of Belief Propagation (Departmental Seminar) University of Southampton, Southampton, UK

Major Collaborators

- Dr. Ferdinando Fioretto, Topic: Combining Machine Learning with Classical Optimisation
  Faculty of Engineering & Computer Science, Syracuse University, NY, USA

- Prof. Catholijn M. Jonker, Topic: Aggregation of Participatory Value Systems
  Faculty of Computer Science, Delft University of Technology, Delft, Netherlands

- 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

Journal Publications

[1] Marc Serramia, Manel Rodriguez-Soto, Maite Lopez-Sanchez, Juan A. Rodríguez-Aguilar, **Filippo Bistaffa**, Paula Boddington, Michael Wooldridge, and Carlos Ansotegui. Encoding Ethics to Compute Value-Aligned Norms. In *Minds & Machines*, 2023 (**Q1**, impact factor: **7.4**). DOI: `10.1007/s11023-023-09649-7`.

[2] Francisco Salas-Molina, **Filippo Bistaffa**, and Juan A. Rodríguez-Aguilar. A General Approach for Computing a Consensus in Group Decision Making that Integrates Multiple Ethical Principles. In *Socio-Economic Planning Sciences*, 2023 (**Q1**, impact factor: **6.1**). DOI: `10.1016/j.seps.2023.101694`.

[3] Dave de Jonge, **Filippo Bistaffa**, and Jordi Levy. Multi-Objective Vehicle Routing with Automated Negotiation. In *Applied Intelligence*, 2022 (**Q2**, impact factor: **5.300**). DOI: `10.1007/s10489-022-03329-2`.

[4] **Filippo Bistaffa**, Georgios Chalkiadakis, and Alessandro Farinelli. Efficient Coalition Structure Generation via Approximately Equivalent Induced Subgraph Games. In *IEEE Transactions on Cybernetics*, 2021 (**Q1**, impact factor: **19.118**). DOI: `10.1109/TCYB.2020.3040622`.

[5] **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*, 2021 (**Q1**, impact factor: **9.551**). DOI: `10.1109/TITS.2019.2954982`.

[6] 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*, 2019 (**Q1**, impact factor: **5.921**). DOI: `10.1016/j.knosys.2019.06.007`.

[7] **Filippo Bistaffa** and Alessandro Farinelli. A COP Model for Graph-Constrained Coalition Formation. In *Journal of Artificial Intelligence Research*, 2018 (**Q2**, impact factor: **1.820**). DOI: `10.1613/jair.1.11205`.

[8] **Filippo Bistaffa**, Georgios Chalkiadakis, Alessandro Farinelli, and Sarvapali D. Ramchurn. A Cooperative Game-Theoretic Approach to the Social Ridesharing Problem. In *Artificial Intelligence*, 2017 (**Q1**, impact factor: **3.034**). DOI: `10.1016/j.artint.2017.02.004`.

[9] **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*, 2017 (**Q1**, impact factor: **2.973**). DOI: `10.1145/3040967`.

[10] **Filippo Bistaffa**, Nicola Bombieri, and Alessandro Farinelli. An Efficient Approach for Accelerating Bucket Elimination on GPUs. In *IEEE Transactions on Cybernetics*, 2017 (**Q1**, impact factor: **8.803**). DOI: `10.1109/TCYB.2016.2593773`.

[11] 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*, 2017 (**Q1**, impact factor: **2.819**). DOI: `10.1016/j.engappai.2016.12.018`.

[12] Michele Roncalli, **Filippo Bistaffa**, and Alessandro Farinelli. Decentralized Power Distribution in the Smart Grid with Ancillary Lines. In *Mobile Networks and Applications*, 2017 (**Q1**, impact factor: **2.497**). DOI: `10.1007/s11036-017-0893-y`.

Peer-Reviewed Conference Publications

[13] **Filippo Bistaffa**. Faster Exact MPE and Constrained Optimization with Deterministic Finite State Automata. In *International Joint Conference on Artificial Intelligence* (IJCAI), 2023 (CORE **A***). DOI: `10.24963/ijcai.2023/209`.

[14] Enrico Liscio, Roger Lera-Leri, **Filippo Bistaffa**, Roel Dobbe, Catholijn Jonker, Maite Lopez-Sanchez, Juan A. Rodríguez-Aguilar, and Pradeep Murukannaiah. Value Inference in Sociotechnical Systems. In *International Conference on Autonomous Agents and Multiagent Systems* (AAMAS), 2023 (CORE **A***). DOI: `10.5555/3545946.3598838`.

[15] Tomas Trescak, Roger Lera Leri, **Filippo Bistaffa**, and Juan A. Rodríguez-Aguilar. Agent-Assisted Life-Long Education and Learning. In *International Conference on Autonomous Agents and Multiagent Systems* (AAMAS), 2022 (CORE **A***). DOI: `10.5555/3535850.3536117`.

[16] Roger Lera-Leri, **Filippo Bistaffa**, Marc Serramia, Maite Lopez-Sanchez, and Juan A. Rodríguez-Aguilar. Towards Pluralistic Value Alignment: Aggregating Value Systems through ℓ_p-Regression. In *International Conference on Autonomous Agents and Multiagent Systems* (AAMAS), 2022 (CORE **A***). DOI: `10.5555/3535850.3535938`.

[17] Dave de Jonge, **Filippo Bistaffa**, and Jordi Levy. A Heuristic Algorithm for Multi-Agent Vehicle Routing with Automated Negotiation. In *International Conference on Autonomous Agents and Multiagent Systems* (AAMAS), 2021 (CORE **A***). DOI: `10.5555/3463952.3464004`.

[18] 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: `10.1007/978-3-030-03098-8_6`.

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

[20] Ewa Andrejczuk, **Filippo Bistaffa**, Christian Blum, Juan A. Rodríguez-Aguilar, and Carles Sierra. Solving the Synergistic Team Composition Problem. In *International Conference on Autonomous Agents and Multiagent Systems* (AAMAS), 2018 (CORE **A***). DOI: `10.5555/3237383.3238001`.

[21] **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***). DOI: `10.5555/3237383.3237981`.

[22] **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: `10.3233/978-1-61499-672-9-125`.

[23] **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 **A**). DOI: `10.1145/2792838.2800177`.

[24] **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`.

[25] **Filippo Bistaffa**, Alessandro Farinelli, and Nicola Bombieri. Optimising Memory Management for Belief Propagation in Junction Trees Using GPGPUs. In *International Conference on Parallel and Distributed Systems* (ICPADS), 2014 (CORE **B**). DOI: `10.1109/padsw.2014.7097850`.

[26] **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***). DOI: `10.5555/2615731.2615737`.

[27] **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: `10.1109/WI-IAT.2013.100`.

[28] **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: `10.1109/energycon.2012.6348270`.

[29] **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***). DOI: `10.5555/2343896.2344061`.

Peer-Reviewed Workshop Publications

[30] **Filippo Bistaffa**, Juan A. Rodríguez-Aguilar, and Jesús Cerquides. Predicting Requests in Large-Scale Online P2P Ridesharing. In *International Workshop on Optimisation and Learning in Multiagent Systems* (OptLearnMAS), 2020.

[31] **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.

[32] **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

[33] **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***). DOI: `10.5555/2615731.2616142`.

Miscellaneous

[34] Adrià Fenoy, **Filippo Bistaffa**, and Alessandro Farinelli. An Attention Model for the Formation of Collectives in Real-World Domains. In *Artificial Intelligence*, 2024 (to appear) (**Q1**, impact factor: **14.4**).

International Research Visits

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

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