

CURRICULUM VITAE

Filippo Bistaffa

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Personal Information

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- **SCOPUS ID:** 55516740200

Academic Positions

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|-------------------|------------------------------------------------------------------------------------------------------------|
| 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 |

Biography

During my career, I have been focusing on the **multi-perspective study of Constrained Optimisation**, making **strong contributions to the state-of-the-art** both on **theoretical** and **practical** aspects and by tackling different **real-world domains**, such as collective energy purchasing, sustainable mobility, cooperative learning, high-performance computing, and AI-human value alignment. My work has been published in **32** articles, both in leading journals (**85%** of my journal articles are **Q1**) and top-level conferences (**84%** of my conference papers are **CORE A/A***). I received my PhD (Doctor Europæus) in April 2016 at the University of Verona with a thesis entitled “Constraint Optimisation Techniques for Real-World Applications”, which was given the “Young Doctors Award” (Special Mention) by the Italian Association for AI (AIxIA). In 2017, I was awarded a **Marie Skłodowska-Curie Individual Fellowship** (the most prestigious post-doctoral fellowship at the European level), which I spent at the IIIA Institute of the Spanish National Research Council (CSIC). 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 ITBID’s commercial product with a Technology Readiness Level of 7 (<https://bit.ly/avi-ia>). I recently became a **CSIC Tenured Researcher** (*Científico Titular*) and I am currently leading, as part of the “YOMA OR” project funded by the Botnar Foundation, the research line aiming to recommend personalised learning pathways that maximise the acquisition of professional skills for young learners in Africa.

Indicators: **Google Scholar:** Citations: 508, 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 (AIxIA) “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
10/2009	B.Eng. Computer Engineering , University of Pavia Thesis: Implementation of Network Lossy Links with Kernel Linux 2.6

Participation in Research Projects

10/2023 – 08/2026	Title: Advanced Computing Techniques to Achieve Sustainable Development (ACISUD) Position: Tenured Researcher, IIIA-CSIC, Barcelona, Spain Funding: MICINN (183,500 euro)
11/2022 – 05/2024	Title: Youth Marketplace Operational Research (YOMA OR) Position: Tenured Researcher, IIIA-CSIC, Barcelona, Spain Funding: Botnar Foundation (800,000 euro)
10/2021 – 10/2022	Title: An AI-Based System to Support Purchasing Processes (AVI-IA) Position: <u>Principal Investigator</u> , 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: <u>Marie-Curie Fellow</u> , IIIA-CSIC, Barcelona, Spain 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 Formación** (FJC-2016, renounced due to incompatibility with MSCA fellowship)
1st place in “Computation and Information Technology Sciences” ranking
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Technology Contributions

- **Notarial Registry:** “CoMe4Ride”: Large-Scale Online Ridesharing Optimisation Software
Reference: N^o 3757/2019, (registered by CSIC on the 18th of October 2019)
- **Notarial Registry:** “SynTeam”: Team Formation Optimisation for Cooperative Learning
Reference: N^o 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 (~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
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.	8 students (2 in 2024, 2022, 2021, 2020, 2 in 2019, 2015)

Scientific Community Service

- Organiser and Chair of OptLearnMAS workshop at AAMAS conference (CORE **A***), since 2023
- IIIA coordinator of CSIC's Interdisciplinary Platform on Mobility (PTI Mobility 2030), 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

Journal Publications

- [1] Roger Lera-Leri, Enrico Liscio, **Filippo Bistaffa**, Catholijn Jonker, Maite Lopez-Sanchez, Juan A. Rodríguez-Aguilar, Pradeep Murukannaiah, Francisco Salas-Molina. Aggregating Value Systems for Decision Support. In *Knowledge-Based Systems*, 2024, in press (**Q1**, impact factor: **8.8**).
- [2] Adrià Fenoy, **Filippo Bistaffa**, Alessandro Farinelli. An Attention Model for the Formation of Collectives in Real-World Domains. In *Artificial Intelligence*, 2024 (**Q1**, impact factor: **14.4**). DOI: 10.1016/j.artint.2023.104064.
- [3] Marc Serramia, Manel Rodriguez-Soto, Maite Lopez-Sanchez, Juan A. Rodríguez-Aguilar, **Filippo Bistaffa**, Paula Boddington, Michael Wooldridge, 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.
- [4] Francisco Salas-Molina, **Filippo Bistaffa**, 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.
- [5] Dave de Jonge, **Filippo Bistaffa**, Jordi Levy. Multi-Objective Vehicle Routing with Automated Negotiation. In *Applied Intelligence*, 2022 (**Q2**, impact factor: **5.3**). DOI: 10.1007/s10489-022-03329-2.
- [6] **Filippo Bistaffa**, Georgios Chalkiadakis, Alessandro Farinelli. Efficient Coalition Structure Generation via Approximately Equivalent Induced Subgraph Games. In *IEEE Transactions on Cybernetics*, 2022 (**Q1**, impact factor: **11.8**). DOI: 10.1109/TCYB.2020.3040622.
- [7] **Filippo Bistaffa**, Christian Blum, Jesús Cerquides, Alessandro Farinelli, 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: **9.6**). DOI: 10.1109/TITS.2019.2954982.
- [8] Ewa Andrejczuk, **Filippo Bistaffa**, Christian Blum, Juan A. Rodríguez-Aguilar, Carles Sierra. Synergistic Team Composition: A Computational Approach to Foster Diversity in Teams. In *Knowledge-Based Systems*, 2019 (**Q1**, impact factor: **5.9**). DOI: 10.1016/j.knosys.2019.06.007.
- [9] Michele Roncalli, **Filippo Bistaffa**, Alessandro Farinelli. Decentralized Power Distribution in the Smart Grid with Ancillary Lines. In *Mobile Networks and Applications*, 2019 (**Q2**, impact factor: **2.6**). DOI: 10.1007/s11036-017-0893-y.
- [10] **Filippo Bistaffa** and Alessandro Farinelli. A COP Model for Graph-Constrained Coalition Formation. In *Journal of Artificial Intelligence Research*, 2018 (**Q3**, impact factor: **1.8**). DOI: 10.1613/jair.1.11205.
- [11] **Filippo Bistaffa**, Georgios Chalkiadakis, Alessandro Farinelli, Sarvapali D. Ramchurn. A Cooperative Game-Theoretic Approach to the Social Ridesharing Problem. In *Artificial Intelligence*, 2017 (**Q1**, impact factor: **3.0**). DOI: 10.1016/j.artint.2017.02.004.
- [12] **Filippo Bistaffa**, Alessandro Farinelli, Jesús Cerquides, Juan A. Rodríguez-Aguilar, 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: **3.0**). DOI: 10.1145/3040967.
- [13] **Filippo Bistaffa**, Nicola Bombieri, Alessandro Farinelli. An Efficient Approach for Accelerating Bucket Elimination on GPUs. In *IEEE Transactions on Cybernetics*, 2017 (**Q1**, impact factor: **8.8**). DOI: 10.1109/TCYB.2016.2593773.
- [14] Alessandro Farinelli, Manuele Bicego, **Filippo Bistaffa**, 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: **2.8**). DOI: 10.1016/j.engappai.2016.12.018.

International Conference Publications

- [15] Errikos Streviniotis, Athina Georgara, **Filippo Bistaffa**, Georgios Chalkiadakis. FairPlay: A Multi-Sided Fair Dynamic Pricing Policy for Hotels. In *AAAI Conference on Artificial Intelligence* (AAAI), 2024 (CORE A*, to appear).
- [16] **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.
- [17] Enrico Liscio, Roger Lera-Leri, **Filippo Bistaffa**, Roel Dobbe, Catholijn Jonker, Maite Lopez-Sanchez, Juan A. Rodríguez-Aguilar, 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.
- [18] Tomas Trescak, Roger Lera Leri, **Filippo Bistaffa**, 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.
- [19] Roger Lera-Leri, **Filippo Bistaffa**, Marc Serramia, Maite Lopez-Sanchez, 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.
- [20] Dave de Jonge, **Filippo Bistaffa**, 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.
- [21] Ewa Andrejczuk, **Filippo Bistaffa**, Christian Blum, Juan A. Rodríguez-Aguilar, 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.
- [22] **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.
- [23] Ewa Andrejczuk, **Filippo Bistaffa**, Christian Blum, Juan A. Rodríguez-Aguilar, 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.
- [24] **Filippo Bistaffa**, Juan A. Rodríguez-Aguilar, Jesús Cerquides, 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.
- [25] **Filippo Bistaffa**, Nicola Bombieri, 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.
- [26] **Filippo Bistaffa**, Georgios Chalkiadakis, Alessandro Farinelli, 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.
- [27] **Filippo Bistaffa**, Alessandro Farinelli, 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>.
- [28] **Filippo Bistaffa**, Alessandro Farinelli, 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.
- [29] **Filippo Bistaffa**, Alessandro Farinelli, Jesús Cerquides, Juan A. Rodríguez-Aguilar, 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.
- [30] **Filippo Bistaffa**. Parallel Algorithms for Hard Combinatorial Optimisation Problems in Multi-Agent Systems (Doctoral Consortium). In *International Conference on Autonomous Agents and Multiagent Systems* (AAMAS), 2014 (CORE A*). DOI: 10.5555/2615731.2616142.

- [31] **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.
- [32] **Filippo Bistaffa**, Alessandro Farinelli, Meritxell Vinyals, Alex Rogers. Coalitional Energy Purchasing in the Smart Grid. In *IEEE International Energy Conference & Exhibition (ENERGYCON)*, 2012. DOI: 10.1109/energycon.2012.6348270.
- [33] **Filippo Bistaffa**, Alessandro Farinelli, Meritxell Vinyals, 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

- [34] **Filippo Bistaffa**, Juan A. Rodríguez-Aguilar, Jesús Cerquides. Predicting Requests in Large-Scale On-line P2P Ridesharing. In *International Workshop on Optimisation and Learning in Multiagent Systems (OptLearnMAS)*, 2020.
- [35] **Filippo Bistaffa**, Alessandro Farinelli, Jesús Cerquides, Juan A. Rodríguez-Aguilar, 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.
- [36] **Filippo Bistaffa**, Alessandro Farinelli, Meritxell Vinyals, Alex Rogers. Stable Coalition Formation Among Energy Consumers in the Smart Grid. In *International Workshop on Agent Technologies for Energy Systems (ATES)*, 2012.

Dissemination & Outreach Activities

09/01/2024	Optimisation and Learning Approaches for Multi-Agent Systems (Invited Seminar) University of Verona, Verona, Italy
13/07/2023	AI Techniques for Sustainable Shared Mobility (Barcelona Metropolis, Barcelona City Hall) Awarded by the ACIA the 2 nd Prize for the Best Artificial Intelligence Dissemination Work
08/07/2022	Mathematical Education & Artificial Intelligence (Moderator, AI-HUB Summer School) CaixaForum, Palma de Mallorca, Spain (https://youtu.be/V1BjRm2XFZ8)
09/12/2021	AI for Shared Mobility (Invited Seminar by Zaragoza's Chamber of Commerce) University of Zaragoza, Zaragoza, Spain
24/03/2021	AI for Shared Mobility (Invited Seminar by IberCaja Foundation) Online, https://youtu.be/moS77BKEYE
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 (https://youtu.be/9fii0vcmxwA)
25/10/2019	Constrained Optimisation for Collective Intelligence Applications (Invited Seminar) Pompeu Fabra University, Barcelona, Spain

International Research Visits

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

Major Collaborations

- Prof. Gauthier Picard, Topic: Constrained Optimisation in Multi-Agent Systems
Information Processing & Systems Department, ONERA, University of Toulouse, France
- 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 Social Good
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 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 Social Good
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