

# CURRICULUM VITAE

Filippo Bistaffa

August 2022

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## Contacts

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- **Email:** [filippo.bistaffa@gmail.com](mailto:filippo.bistaffa@gmail.com)
- **Webpage:** <https://filippobistaffa.github.io>
- **ORCID:** 0000-0003-1658-6125
- **Web of Science Researcher ID:** AAA-4942-2020
- **SCOPUS Author ID:** 55516740200

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## Academic Positions

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| 10/2021 – ongoing | <b>Principal Investigator</b><br>Department of Multi-Agent Systems, IIIA-CSIC, Barcelona, Spain            |
| 08/2019 – 09/2021 | <b>Postdoctoral Research Fellow</b><br>Department of Multi-Agent Systems, IIIA-CSIC, Barcelona, Spain      |
| 06/2017 – 06/2019 | <b>Marie-Curie Fellow</b><br>Department of Multi-Agent Systems, IIIA-CSIC, Barcelona, Spain                |
| 01/2016 – 06/2017 | <b>Postdoctoral Research Fellow</b><br>Department of Computer Science, University of Verona, Verona, Italy |

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## Short Bio

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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 postdoctoral 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. Subsequently, I continued as a Postdoctoral Research Fellow at the IIIA-CSIC as part of the LOGISTAR project, in charge of designing and implementing optimisation solution techniques for collaborative transportation and logistics (co-loading). Currently I am the **Principal Investigator** of the AVI-IA project, whose objective is to develop an AI-based system that guides strategic decisions in purchasing processes. Such a system will include an analysis module that allows to evaluate the reliability (or the risk) associated with each provider and a recommendation module that proposes the best negotiation strategy based on the historical data about completed negotiations.

Indicators:     **Google Scholar:** Citations: 384, h-index: 11, i10-index: 12  
                  **Scopus:** Citations: 197, h-index: 8

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## Graduate Studies

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

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## Participation in Research Projects

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10/2021 – ongoing	<b>Title:</b> An AI-Based System to Support Purchasing Processes (AVI-IA) <b>Position:</b> Principal Investigator, IIIA-CSIC, Barcelona, Spain <b>Funding:</b> Private Contract with ITBID Company (119,500 euro)
06/2020 – ongoing	<b>Title:</b> Computational Intelligence for Sustainable Development Goals (CI-SUSTAIN) <b>Position:</b> Postdoctoral Research Fellow, IIIA-CSIC, Barcelona, Spain <b>Funding:</b> MICINN (102,850 euro)
08/2019 – 09/2021	<b>Title:</b> Data Management Techniques for Real Time Logistics Planning (LOGISTAR) <b>Position:</b> Postdoctoral Research Fellow, IIIA-CSIC, Barcelona, Spain <b>Funding:</b> H2020 (5,000,000 euro)
06/2017 – 06/2019	<b>Title:</b> Collectiveware: Highly-parallel Algorithms for Collective Intelligence (HPA4CF) <b>Position:</b> Marie-Curie Fellow, IIIA-CSIC, Barcelona, Spain <b>Supervisor:</b> Prof. Juan A. Rodríguez-Aguilar <b>Funding:</b> H2020-MSCA-IF-2016 (158,121 euro)
01/2016 – 06/2017	<b>Title:</b> Development of AI Techniques for Sustainable Commuting (AI-SC) <b>Position:</b> Postdoctoral Research Fellow, University of Verona, Italy <b>Funding:</b> University of Verona (29,000 euro)

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## Fellowships & Awards

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- **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)  
1<sup>st</sup> 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\$)
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## Technology Contributions

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- **Notarial Registry:** “CoMe4Ride”: Large-Scale Online Ridesharing Optimisation Software  
**Reference:** N<sup>o</sup> 3757/2019, (registered by CSIC on the 18<sup>th</sup> of October 2019)
- **Notarial Registry:** “SynTeam”: Team Formation Optimisation for Cooperative Learning  
**Reference:** N<sup>o</sup> 2301/2020, (registered by CSIC on the 29<sup>th</sup> of June 2020)

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## Teaching Experience

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4–9/07/2022	<b>Lecturer</b> – “Computational Sustainability in Multi-Agent Systems” AI-HUB Summer School, Palma de Mallorca, Spain (95 attendees)
9–13/05/2022	<b>Lecturer</b> – “Tutorial on Multi-Agent Distributed Constrained Optimization” International Conference on Autonomous Agents and MAS (AAMAS), Online (40 attendees)
19–23/07/2021	<b>Lecturer</b> – “Constrained Optimisation for Multi-Agent Systems” European Agent Systems Summer School (EASSS), Online (110 attendees)
1–5/07/2019	<b>Lecturer</b> – “Constrained Optimisation for Multi-Agent Systems” Advanced Course on AI (ACAI) Summer School, Crete, Greece (90 attendees)
2013 – 2016	<b>Tutor</b> – “Algorithms (Programming Laboratory II)” University of Verona, Verona, Italy (~40 students/year)

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## Supervised Students

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Since 2021	Roger Xavier Lera Leri ( <b>Ph.D.</b> ) 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 ( <b>Ph.D.</b> , co-supervised with Dr. Christian Blum) Thesis: High-Performance Combinatorial Optimisation for Sustainable Development Goals Department of Multi-Agent Systems, IIIA-CSIC, Barcelona, Spain
Since 2019	Adrià Fenoy ( <b>Ph.D.</b> , co-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
<b>M.Sc.</b>	6 students (1 in 2022 and 1 in 2021 funded by JAE Intro ICU, 1 in 2020, 2 in 2019, 1 in 2015)

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## Scientific Community Service

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- Organiser of OptLearnMAS workshop at AAMAS conference (CORE **A\***), starting in 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 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
- Board member for ACIA (Associació Catalana d’Intel·ligència Artificial) M.Sc. thesis award 2019

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## Dissemination & Outreach Activities

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08/07/2022	Mathematical Education & Artificial Intelligence (Moderator, part of AI-HUB Summer School) CaixaForum, Palma de Mallorca, Spain
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 <a href="https://youtu.be/moS77BKEYE">https://youtu.be/moS77BKEYE</a>
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 <a href="https://youtu.be/9fii0vcmxwA">https://youtu.be/9fii0vcmxwA</a> )
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
05/12/2013	Game Theory for Computer Science (Departmental Seminar) University of Verona, Verona, Italy

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## Major Collaborators

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- 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

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## Publications Summary<sup>1</sup>

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- International AI journals: 10 articles
  - Q1: 8 articles
  - Q2: 2 article
- International AI conferences: 16 articles
  - CORE A\*: 10 articles
  - CORE A: 2 article

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## Journal Publications

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- [1] **Filippo Bistaffa**, Georgios Chalkiadakis, and Alessandro Farinelli. Efficient Coalition Structure Generation via Approximately Equivalent Induced Subgraph Games. In *IEEE Transactions on Cybernetics* (IEEE TCYB), 2022 (**Q1**, impact factor: **19.118**). DOI: 10.1109/TCYB.2020.3040622.
- [2] Dave de Jonge, **Filippo Bistaffa**, and Jordi Levy. Multi-Objective Vehicle Routing with Automated Negotiation. In *Applied Intelligence* (APIN), in press (**Q2**, impact factor: **5.019**). DOI: 10.1007/s10489-022-03329-2.
- [3] **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), 2021 (**Q1**, impact factor: **9.551**). DOI: 10.1109/TITS.2019.2954982.
- [4] 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: 10.1016/j.knosys.2019.06.007.
- [5] **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: 10.1613/jair.1.11205.
- [6] **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: 10.1016/j.artint.2017.02.004.
- [7] **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: 10.1145/3040967.
- [8] **Filippo Bistaffa**, Nicola Bombieri, and Alessandro Farinelli. An Efficient Approach for Accelerating Bucket Elimination on GPUs. In *IEEE Transactions on Cybernetics* (IEEE TCYB), 2017 (**Q1**, impact factor: **8.803**). DOI: 10.1109/TCYB.2016.2593773.
- [9] 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: 10.1016/j.engappai.2016.12.018.
- [10] 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: 10.1007/s11036-017-0893-y.

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<sup>1</sup>Quartiles and impact factors according to Journal Citation Reports. For articles published later than 2021, most recent impact factor available from Journal Citation Reports (2021) is reported.

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## Peer-Reviewed Conference Publications

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- [11] 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.
- [12] Roger Lera-Leri, **Filippo Bistaffa**, Marc Serramia, Maite Lopez-Sanchez, and Juan A. Rodríguez-Aguilar. Towards Pluralistic Value Alignment: Aggregating Value Systems through  $\ell_p$ -Regression. In *International Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, 2022 (CORE A\*). DOI: 10.5555/3535850.3535938.
- [13] 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.
- [14] 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.
- [15] **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.
- [16] 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.
- [17] **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.
- [18] **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.
- [19] **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.
- [20] **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>.
- [21] **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.
- [22] **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.
- [23] **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.
- [24] **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.
- [25] **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.

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## Peer-Reviewed Workshop Publications

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- [26] **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.
- [27] **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.

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## Doctoral Consortium Publications

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- [28] **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.

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## Stays Abroad

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

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