

Curriculum Vitae

Gianni A. Di Caro



1. Personal Data

- ◆ FAMILY, FIRST AND MIDDLE NAME: Di Caro, Gianni Andrea
- ◆ DATE AND PLACE OF BIRTH: 06/06/1965, Pescara (Italy)
- ◆ AFFILIATION: Carnegie Mellon University (CMU) - Department of Computer Science
- ◆ E-MAIL, WEB PAGE: gdicaro AT cmu DOT ch, <http://www.giannidicaro.com>
- ◆ TOTAL CITATIONS / H-INDEX / I10-INDEX : 15,900 / 32 / 63 (Source: *Google Scholar*, <http://scholar.google.com>)

2. Education

- ◆ **Doctorate, with Full Honors - 11/2004**
INSTITUTION: Faculty of Applied Sciences, Université Libre de Bruxelles (ULB), Brussels, Belgium
DISSERTATION: *Ant Colony Optimization and its application to adaptive routing in telecommunication networks*
SUPERVISOR: Prof. M. Dorigo, FNRS & IRIDIA
- ◆ **Diplôme d'Études Approfondies (D.E.A.) (Master of Applied Sciences) - 05/2001**
INSTITUTION: Faculty of Applied Sciences, Université Libre de Bruxelles, Brussels, Belgium
DISSERTATION: *A society of ant-like agents for adaptive routing in networks*
SUPERVISOR: Prof. M. Dorigo, FNRS & IRIDIA
- ◆ **Laurea in Physics (MSc. equivalent), Summa Cum Laude - 03/1992**
INSTITUTION: Faculty of Mathematical and Physical Sciences, University of Bologna, Bologna, Italy
DISSERTATION: *Implementation of a transputer-based system for real-time parallel data acquisition and the online control of large detectors for particle physics* (in Italian)
SUPERVISORS: Prof. R. Campanini and Dr. I. D'Antone, Department of Physics, Bologna

3. Current Research Topics

My scientific background is highly **inter-disciplinary**. Accordingly, my research focuses on multiple parallel directions, with a mutual cross-fertilization of ideas and synergies of results.

Current research interests and activities include: **planning, coordination, and navigation in robot swarms and in networked multi-robot systems; interaction and cooperation between humans and multi-robot systems; routing and control in sensor and mobile ad hoc networks; bio-inspired computing and swarm intelligence; mathematical and heuristic optimization; artificial intelligence.**

My *general goal* is to define robust, scalable, and cooperative solutions for **mixed systems**, heterogeneous teams including humans and multiple robotic agents.

The *application scenarios* of interest include: **ambient assisted living, search and rescue, monitoring and surveillance, transportation and manufacturing.**

4. Academic and Research Positions

1. **Associate Teaching Professor [08/2016 -]**
INSTITUTION: *Carnegie Mellon University (CMU), CS Department - Qatar Campus*
ACTIVITIES: Teaching in the domains of robotics and artificial intelligence, research in related domains

2. **Senior Researcher, permanent position [03/2010 - 08/2016]**
INSTITUTION: *“Dalle Molle” Institute for Artificial Intelligence (IDSIA), Lugano (CH)*
ACTIVITIES: Research, teaching, and project writing in the domains of networking, swarm robotics, swarm intelligence, human-robot interaction, coordination and cooperation in multi-agent systems, ambient assisted living, autonomous robotics, combinatorial optimization, smart grids.

3. **Post-Doctoral Researcher [10/2006 - 03/2010]**
INSTITUTION: *“Dalle Molle” Institute for Artificial Intelligence (IDSIA), Lugano (CH)*
RESEARCH: Design and control of an innovative robotic system made of a swarm of heterogeneous autonomous robots acting and interacting in the full 3D space (EU-funded FET project *Swarmanoid*).

4. **Post-Doctoral Researcher [05/2003 - 09/2006]**
INSTITUTION: *“Dalle Molle” Institute for Artificial Intelligence (IDSIA), Lugano (CH)*
RESEARCH: Study of nature’s complex adaptive systems to design robust self-organizing systems for optimization and control in peer-to-peer and mobile ad-hoc networks (EU-funded FET project *BISON*).

5. **Marie Curie Postdoc Fellow [11/2001 - 04/2003]**
INSTITUTION: *IRIDIA, Université Libre de Bruxelles (ULB), Brussels (Belgium)*
RESEARCH: Application of artificial intelligence techniques for control and optimization in telecommunication networks, modeling of complex biological systems.

6. **Research Assistant for Japan Science and Technology Corporation (JST) [01/2001 - 09/2001]**
INSTITUTION: *Advanced Telecommunications Research (ATR), Kyoto (Japan)*
RESEARCH: Brain modeling, reinforcement learning in partially observable environments, adaptive setting of meta-parameters for learning algorithms, multi-agent learning.

7. **Science and Technology in Japan Fellow [02/1999 - 11/2000]**
INSTITUTION: *HIP Labs, Advanced Telecommunications Research (ATR), Kyoto (Japan)*
RESEARCH: Distributed multi-agent algorithms for sequential decision making in non-Markovian situations, simulation and analysis of the human immune system.

8. **TMR - Marie Curie Fellow [08/1996 - 02/1999]**
INSTITUTION: *IRIDIA, Université Libre de Bruxelles (ULB), Brussels (Belgium)*
RESEARCH: Reinforcement learning algorithms for distributed and partially observable environments, applications to adaptive routing and load balancing in telecommunication networks.

9. **Research Assistant [03/1996 - 06/1996]**
INSTITUTION: *Department of Biomedical Sciences, University of Modena, Modena (Italy)*
RESEARCH: Modeling of biological and evolutionary systems, management of local computing resources.

10. **Research Consultant [12/1995 - 02/1996]**
INSTITUTION: *Istituto per la Ricerca Scientifica e Tecnologica (IRST), Trento (Italy)*
RESEARCH: Software integration and design of architectures for autonomous robot programming.

11. **Research Assistant [01/1995 - 12/1995]**

INSTITUTION: *Department of Mathematics, University of Trento, Trento (Italy)*

RESEARCH: Development of heuristic algorithms for combinatorial optimization, administration of unix systems and web sites, application of image processing and software engineering techniques.

12. **Post-Graduate Research Fellow [01/1994 - 12/1994]**

INSTITUTION: *IRST, Trento (Italy)*

RESEARCH: Implementation of a real-time stereoscopic vision system for autonomous robotic navigation using a parallel network of digital signal processors.

13. **Post-Graduate Research Fellow [07/1993 - 12/1993]**

INSTITUTION: *IRST, Trento (Italy)*

RESEARCH: Design and realization of a concurrent real-time software architecture for the management of the activities of a mobile autonomous robot equipped with multiple sensors.

14. **Graduate Research Assistant [04/1992 - 07/1993]**

INSTITUTION: *Department of Physics, University of Bologna, Bologna (Italy)*

RESEARCH: Parallel implementations of genetic algorithms for optimization, application of fuzzy logic and classical pattern recognition techniques to the discrimination of sub-atomic particle beams.

5. Project Grants and Research Fellowships

1. **Swiss NCCR-Robotics Phase 2, sub-projects:** *(i) Symbiotic interaction between humans and multi-robot systems, (ii) Coalition-level team planning, (iii) Resilient path planning for ground robots [12/2014, 4 years].*

Role: *Projects' Co-PI* with Luca Gambardella (IDSIA).

The three sub-projects (600,000 CHF funding) are integral part of the nation-wide NCCR Robotics, Center of Excellence of Swiss NSF. In its Phase 2, the Center includes 18 research groups and is supported by a grant of more than 12M CHF (www.nccr-robotics.ch). IDSIA sub-projects address: multi-modal interaction and communication between humans and multiple robots; system-level planning in the space of the feasible coalitions that can be built in mixed human-robot teams; path planning models that are resilient to multiple local failures.

2. **EU-AAL project ALMA: Ageing without Losing Mobility and Autonomy [4/2013, 3.5 years].**

Role: *Project Coordinator and Principal Investigator (PI).*

3M EUR grant funded by the scientific institutions of the European Union in the AAL (Ambient Assisted Living) framework. The consortium includes 8 partners (academic, industrial, and care-giving ones). The project (www.alma-aal.org) aims to support autonomous mobility, navigation, and orientation of the mobility-impaired person through the realization of a set of ambient intelligence and robotic technologies and their integration into a modular system. Pilot testing is performed at real end-user institutions.

3. **Swiss NCCR-Robotics sub-project *Let's play together with robot swarms!* [7/2013, 1 year].**

Role: *Project Co-PI* with Luca Gambardella (IDSIA) and Francesco Mondada (EPFL).

100K CHF grant funded in the context of NCCR Robotics, Center of Excellence of Swiss National Science Foundation (NSF) (www.nccr-robotics.ch), Phase 1. The project designed and implemented game scenarios, both in software and using real robots, to study strategies and modalities to let humans and multi-robot systems effectively teaming up.

4. **Swiss SINERGIA project *SWARMIX: Synergistic Interactions in Swarms of Heterogeneous Agents* [2/2011, 3 years].**

Role: *Co-PI* with Luca Gambardella for IDSIA's research activities in the project.

1.1M CHF total grant funded by Swiss NSF, 4 research groups. IDSIA's research for the project addressed the study of *Adaptive planning and communication strategies for heterogeneous swarms*, considering search and rescue scenarios and swarms composed of robots, humans, and dogs.

5. **Swiss NCCR-Robotics sub-project *Symbiotic human-swarm interaction and cooperation* [12/2010, 4 years].**

Role: *Co-PI* with Luca Gambardella for IDSIA's research activities in the project.

The sub-project was integral part of the large nation-wide NCCR Robotics, Center of Excellence of Swiss NSF, including 26 research groups in its Phase 1 and supported by a total grant of 13.3M CHF (www.nccr-robotics.ch). IDSIA's sub-project resulted in robust and scalable methods for the interaction, control, and coordination of heterogeneous symbiotic teams of multiple robots and humans.

6. **FP6 project *SWARMANOID: Towards Humanoid Robotic Swarms* [2006, 4 years].**

Role: *Co-PI* with Luca Gambardella for IDSIA's research activities in the project.

3.9M CHF grant funded by the scientific institutions of the European Union in the FP6 FET Open programme. Consortium of 5 partners. The project focused on the design, implementation, and distributed control of a novel swarm robotic system comprising heterogeneous, dynamically connected small autonomous robots: eye-bots, hand-bots, and foot-bots.

7. **FP5 project *BISON: Biology-Inspired techniques for Self-Organization in dynamic Networks* [2003, 3 years].**

Role: *Co-PI* with Luca Gambardella for IDSIA's research activities in the project (Note: I did not contribute to project writing).

1.7M CHF grant funded by the scientific institutions of the European Union in the FP5 FET Open programme. Consortium of 5 partners. The project focused on developing bio-inspired approaches for the adaptive routing and control in dynamic networks, such as mobile ad hoc and P2P ones.

8. **Marie Curie post-doc fellowship for *Ant and learning agents for adaptive routing and distributed control in communication networks* [11/2001, 2.5 years].**

Individual research grant awarded by the scientific institutions of the European Union.

Host institution: IRIDIA, Université Libre de Bruxelles, Belgium.

9. **Science & Technology in Japan post-doc fellowship for *Mobile stigmergetic agents for control of network systems* [2/1999, 2 years].**

Individual research grant awarded by the scientific institutions of the European Union.

Host institution: Advanced Telecommunications Research International (ATR), Kyoto, Japan.

10. **Training and Mobility of Researchers (TMR) post-doc fellowship for *Multi-agent based techniques for distributed adaptive routing* [2/99, 2.5 years].**

Individual research grant awarded by the scientific institutions of the European Union.

Host institution: Université Libre de Bruxelles, Belgium (Note: the grant was not exploited since at the same time I obtained the S&T Fellowship for Japan, which I selected).

11. **Training and Mobility of Researchers (TMR) post-grad fellowship for *Autonomous reinforcement learning agents for Partially Observable Markov Decision environments* [8/1996, 2.5 years].**

Individual research grant awarded by the scientific institutions of the European Union.

Host institution: IRIDIA, Université Libre de Bruxelles, Belgium

12. **Post-grad fellowship for studies on *Artificial Intelligence and Robotics* [1/1994, 1 year].**

Individual research grant awarded by the municipality of Trento (Italy).

Host institution: Istituto per la Ricerca Scientifica e Tecnologica (IRST), Trento, Italy

13. **Post-grad fellowship for studies on *Pattern Recognition* [7/1993, 6 months].**

Individual research grant awarded by the municipality of Trento (Italy).

Host institution: Istituto per la Ricerca Scientifica e Tecnologica (IRST), Trento, Italy

6. Teaching and Lecturing

6.1 Full semester courses

- ◆ ***Artificial Intelligence: Representation and Problem Solving 15-381*** (Undergraduate, Computer Science Department) - *Carnegie Mellon University in Qatar (CMU-Q)*, Doha, Qatar, academic year 2016-2017.
- ◆ ***Artificial Intelligence: Representation and Problem Solving 15-781*** (Graduate, Computer Science Department) - *Carnegie Mellon University (CMU)*, Pittsburgh, USA, academic year 2016-2017 (Average of course evaluation: 4.64 (max 5)) .
- ◆ ***Robotics*** (Master of Science in Informatics) - *University of Lugano (USI)*, Lugano, Switzerland, from 2014 to 2016.
- ◆ ***Operations research*** (Bachelor in Management Engineering) - *University of Applied Science of Southern Switzerland (SUPSI)*, Lugano, Switzerland, from 2012 to 2016 (Awarded as one of the best teachers at SUPSI/DTI for year 2013).
- ◆ ***Laboratories of Algorithms and Data structures*** (Bachelor in Computer Engineering) - *University of Applied Science of Southern Switzerland (SUPSI)*, Lugano, Switzerland, academic year 2014-2015.
- ◆ ***Heuristics and Heuristics Lab*** (Master of Science in Intelligent Systems) - *University of of Lugano (USI)*, Lugano, Switzerland, from 2008 to 2012.
- ◆ ***Optimization and process evaluation*** (Bachelor in Management Engineering) - *University of Applied Science of Southern Switzerland (SUPSI)*, Lugano, Switzerland, 2008.

6.2 Short courses and Tutorials

- ◆ ***Ant Colony Optimization: theory and hands-on*** (Master of Science in Informatics) - Short course, *Bicocca University*, Milan, Italy, 2013, 8 hours.
- ◆ ***Swarm and collective intelligence*** (Master of Science in Intelligent Systems) - Short course, *University of of Lugano (USI)*, Lugano, Switzerland, from 2007 to 2013, 8 hours.
- ◆ ***Ant Colony Optimization and its application to routing in telecommunication networks*** (Conference Tutorial) - “*ANTS’06, 5th International Workshop on Ant Algorithms and Swarm Intelligence*”, Brussels, Belgium, September 4–7, 2006, 6 hours.
- ◆ ***Ant Colony Optimization: from innovative research to successful industrial applications*** (Post-grad Summer School) - “*1st Summer School on Aspects of Complexity*”, University of Bologna, Bertinoro, Italy, July 18–28, 2005, 12 hours

- ◆ *Swarm intelligence, nature's way to system engineering* (PhD in Informatics) - Department of Electronics, Computer Science and Automation, *University of Girona*, Spain, April 26–27, 2005, 12 hours
- ◆ *Swarm intelligence and metaheuristics for combinatorial optimization* (Post-grad course on Spatial Intelligence) - Department of Geoinformatics, *Helsinki University of Technology (TKK)*, Finland, August 30 - September 3, 2004, 12 hours.

7. Scientific Awards

- ◆ **Most entertaining video award, and nomination for for best video and best robot video awards at the 10th AAAI Video Competition**, Phoenix, February 12–17, 2016. Awarded to the video: *Finding Linda - A Search and Rescue Mission by SWARMIX*, SWARMIX project team.
- ◆ **Nomination for best video award at the 10th AAAI Video Competition**, Phoenix, February 12–17, 2016. Awarded to the video: *Quadcopter Navigation in The Forest*, A. Giusti, J. Guzzi, D. Ciresan, F.-L. He, J. P. Rodriguez, G. A. Di Caro, J. Schmidhuber, L. M. Gambardella, F. Fontana, M. Faessler, C. Forster, D. Scaramuzza.
- ◆ **Nomination for best conference paper at the 11th IEEE Int. Symposium on Safety, Security, and Rescue Robotics (SSRR)**, Linköping, Sweden, October 21–26, 2013. Awarded to paper: *Connectivity-aware planning of search and rescue missions*, E. Feo, M. Kudelski, L. Gambardella, G. A. Di Caro.
- ◆ **Best paper at the 7th Int. Conf. on Bio-Inspired Models of Network, Information, and Computing Systems (BIONETICS)**, Lugano, Switzerland, December 10–11, 2012. Awarded to paper: *Bioinspired obstacle avoidance algorithms for robot swarms*, J. Guzzi, A. Giusti, L. Gambardella, G. A. Di Caro.
- ◆ **Best research paper at the 2nd Annual International Conference on Advanced Topics in Artificial Intelligence (ATAI)**, Singapore, November 24–25, 2011. Awarded to paper: *An algorithm combining linear programming and an ant system for the sequential ordering problem*, M. Mojana, R. Montemanni, G.A. Di Caro and L.M. Gambardella.
- ◆ **Best video award at the 5th AAAI Video Competition**, San Francisco, August 7–11, 2011. Awarded to the video: *Swarmanoid, The Movie*, Swarmanoid project team.
- ◆ **Best conference poster at the 12th Conference Towards Autonomous Robotic Systems (TAROS)**, Sheffield, UK, August 31 – September 2, 2011. Awarded to paper: *Distributed motion planning for ground objects using a network of robotic ceiling cameras*, A. Reina, G.A. Di Caro, F. Ducatelle, L.M. Gambardella.
- ◆ **Best conference paper at the 8th International Conf. on Parallel Problem Solving from Nature (PPSN VIII)**, Birmingham, UK, 18–22 September 2004. Awarded to paper: *AntHocNet: an Ant-Based Hybrid Routing Algorithm for Mobile Ad Hoc Networks*, G. Di Caro, F. Ducatelle and L.M. Gambardella.

8. Editorship and Professional Services

- ◆ **Edited volumes:**

1. G.A. Di Caro, G. Theraulaz (editors), *Bio-Inspired Models of Network, Information, and Computing Systems - Proceedings of the 7th BIONETICS International Conference, 2012*, Springer, LNICST 134, 2014.

2. C. Di Chio, A. Agapitos, S. Cagnoni, C. Cotta, F. Fernández de Vega, G. A. Di Caro, *et al.* (editors), *Proceedings of EvoApplications 2012: EvoCOMNET, EvoCOMPLEX, EvoFIN, EvoGAMES, EvoHOT, EvoIASP, EvoNUM, EvoPAR, EvoRISK, EvoSTIM, and EvoSTOC*, LNCS 7248, Springer, 2012.
3. C. Di Chio, A. Brabazon, G.A. Di Caro, *et al.* (editors), *Proceedings of EvoApplications 2011: EvoCOMNET, EvoFIN, EvoHOT, EvoMUSART, EvoSTIM, and EvoTRANSLOG*, LNCS 6625, Springer, 2011.
4. M. Dorigo, M. Birattari, G.A. Di Caro, *et al.* (editors), *Swarm Intelligence, Proceedings of the 7th International Conference ANTS 2010*, LNCS 6234, Springer, 2010.
5. C. Di Chio, A. Brabazon, G.A. Di Caro, *et al.* (editors) *Proceedings of EvoApplications 2010: EvoCOMNET, EvoENVIRONMENT, EvoFIN, EvoMUSART, and EvoTRANSLOG*, LNCS 6025, Springer, 2010.
6. M. Giacobini, A. Brabazon, S. Cagnoni, G.A. Di Caro, *et al.* (editors). *Proc. of EvoWorkshops 2009: EvoCOMNET, EvoENVIRONMENT, EvoFIN, EvoGAMES, EvoHOT, EvoIASP, EvoINTERACTION, EvoMUSART, EvoNUM, EvoPhD, EvoSTOC, and EvoTRANSLOG*, LNCS 5484, Springer, 2009.
7. M. Giacobini, A. Brabazon, S. Cagnoni, G.A. Di Caro, *et al.* (editors). *Proc. of EvoWorkshops 2008: EvoCOMNET, EvoFIN, EvoHOT, EvoIASP, EvoMUSART, EvoNUM, EvoSTOC, and EvoTRANSLOG*, LNCS 4974, Springer, 2008.
8. M. Giacobini, A. Brabazon, S. Cagnoni, G.A. Di Caro, *et al.* (editors). *Proc. of EvoWorkshops 2007: EvoCOMNET, EvoFIN, EvoIASP, EvoINTERACTION, EvoMUSART, EvoSTOC, and EvoTRANSLOG*, LNCS 4448, Springer, 2007.
9. M. Dorigo, G.A. Di Caro, and M. Sampels (editors). *Ant Algorithms - Proc. of ANTS 2002, 3rd International Workshop on Ant Algorithms*, LNCS 2463, Springer, 2002.

◆ **Conference/Workshop chair:**

1. G. A. Di Caro, *BIONETICS: 7th International Conference on Bio-Inspired Models of Network, Information, and Computing Systems* Lugano, Switzerland, December 10–11, 2012.
2. E. Natalizio, T. Razafindralambo, G. A. Di Caro, *MC³ 2012: 1st International Workshop on Mobility and Communication for Cooperation and Coordination*, in conjunction with the “Int. Conference on Computing, Networking and Communications (ICNC 2012)”, Maui, Hawaii, USA, January 30 – February 2, 2012.
3. G. A. Di Caro, M. Farooq and E. Tarantino, *EvoCOMNET: 9th European Event on the Application of Nature-inspired Techniques to Telecommunication Networks and other Parallel and Distributed Systems*, Malaga, Spain, April 11–13, 2012.
4. G. A. Di Caro, M. Farooq and E. Tarantino, *EvoCOMNET: 8th European Event on the Application of Nature-inspired Techniques to Telecommunication Networks and other Parallel and Distributed Systems*, Turin, Italy, April 27–29, 2011.
5. M. Dorigo, G.A. Di Caro, A. Engelbrecht, L. Gambardella and E. Sahin, *ANTS 2010, 7th International Conference on Swarm Intelligence*, Brussels, Belgium, September 8–10, 2010.
6. G. A. Di Caro, M. Farooq and E. Tarantino, *EvoCOMNET: 7th European Event on the Application of Nature-inspired Techniques to Telecommunication Networks and other Parallel and Distributed Systems*, Istanbul, Turkey, April 7–9, 2010.

7. G. A. Di Caro, M. Farooq and E. Tarantino, *EvoCOMNET: 6th European Workshop on the Application of Nature-inspired Techniques to Telecommunication Networks and other Parallel and Distributed Systems*, Tübingen, Germany, April 15-17, 2009.
8. G. A. Di Caro, F. Ducatelle, A. Forster, G. Venayagamoorthy, *5th IEEE Symposium on Swarm Intelligence, Special Session on: Swarm Intelligence for Wireless Ad Hoc Networks*, St. Louis, Missouri, USA, September 21–23, 2008.
9. G. A. Di Caro and M. Farooq, *EvoCOMNET: 5th European Workshop on the Application of Nature-inspired Techniques to Telecommunication Networks and other Connected Systems*, Naples, Italy, March 26–28, 2008.
10. G. A. Di Caro and M. Farooq, *EvoCOMNET: 4th European Workshop on the Application of Nature-inspired Techniques to Telecomm. Networks and other Connected Systems*, Valencia, Spain, April 11-13, 2007.
11. M. Dorigo, G.A. Di Caro, N. Sampels, *ANTS'02, 3rd International Workshop on Ant Algorithms*, Brussels, Belgium, September 12–14, 2002.

◆ **Journal special issues:**

1. E. Natalizio, G. Di Caro, A. Sekercioglu, E. Yanmaz, Eds., “Special issue on Theory, Algorithms and Applications of Wireless Networked Robotics”, *Ad Hoc Networks*, Elsevier, Vol. 11, N. 7, 2013.
2. M. Dorigo, M. Birattari, G.A. Di Caro, R.Doursat, A. Engelbrecht, L.M. Gambardella, R. Groß, E. Sahin, T. Stützle, Eds., “Special issue of ANTS 2010”, *Swarm Intelligence*, Springer, Vol. 5, N. 3–4, 2011.
3. M. Dorigo, G. A. Di Caro, T. Stützle, Guest Eds. “Special Issue on Ant Algorithms”, *Future Generation Computer Systems (FGCS)*, Elsevier, Vol. 16, N. 8, 2000.

◆ **Editorial boards:**

- *Swarm Intelligence*, Springer

◆ **Journal reviewer:** IEEE Trans. on Systems, Man, and Cyb., Networks, Adaptive Behavior, IEEE Trans. on Evolutionary Comp., J. of Heuristics, Artificial Life, Swarm Intelligence J., Telecomm. Systems, European J. of Operational Research, J. of Networks, ACM Trans. on Internet Technology, J. of Systems Science, J. of System Architectures, J. of Computer Science, Computer Networks, ACM Trans. on Autonomous Adaptive Systems, Electronic and Telecomm. Research Institute J., Ad Hoc Networks, J. of Computational Intelligence and Applications, Sensors, European J. of Operations Research., IEEE Trans. on Robotics, Artificial Intelligence, Robotics and Autonomous Systems, Computational Intelligence.

◆ **Conference PC member, reviewer, or associate editor:** (incomplete list) PPSN V-VII, IEEE SIS 2005–2008, IEEE ICC 2007, DSN 2007, Bio-ADIT, GP 1998, AAMAS 2004, GECCO 2005-2015, ANTS 1998–2014, BIONETICS 2011-2012, IROS 2011-2014, IEEE IoT-SoS 2012, PPSN 2012, ICRA 2013-14, MobiCASE 2013, ALIFE 2014, PPSN 2014, DroNet 2015, TPNC 2015, ICRA 2016 (Associate editor)

◆ **External examiner for master and doctoral theses:**

- Ph.D. thesis of Milan Erdelj: *Mobile wireless sensor network architecture: Applications to mobile sensor deployment*, Université des Sciences et Technologies de Lille, INRIA Lille, France, Octobre 11, 2013

- M.Sc. thesis of Giuseppe Cuccu: *Variable Size Populations for Dynamic Optimization with Genetic Programming*, Computer Science Department, Università Bicocca, Milan, Italy, February 2008
- Ph.D. thesis of Samih Tadrus: *Generic Multi-Pheromone Quality of Service Routing*, School of Computer Science, University of Nottingham, England, July 2007
- Ph.D. thesis of Luc Hogue: *Delay Tolerant Networks: Modelling, Simulation and Broadcast-based Applications*, Computer Science institute, University of Luxembourg, April 2007

9. Supervision of Ph.D., Master, and Internship students

1. **Supervisor of Student Internship in Robotics, 6 months:** *Decentralized position control of data collectors for multicenter data storage in mobile robotic networks*, 2016. Institution: NCCR Robotics, Switzerland. Student: Kaviya Dhanabalachandran.
2. **Co-supervisor for Ph.D. in Informatics:** *Multi-modal human multi-robot interaction*, starting in 2015. Institution: University of Lugano, Switzerland. Work in the context of the NCCR Robotics project “Symbiotic interaction between humans and multi-robot systems” (funded by Swiss NSF). Ph.D. student: Boris Gromov.
3. **Supervisor of Research Internship in Mobile Networking, 4 months:** *Dynamic node placement in robotic MANETs*, 2014. Institution: University of Granada, Spain. Ph.D. Student: Roberto Magán Carrión.
4. **Supervisor of Research Internship in Robotics, 6 months:** *Cooperative monitoring of disaster areas with UAVs teams*, 2014. Institution: NCCR Robotics, Switzerland. Researcher: Fatemeh Mohseni.
5. **Co-supervisor for MSc. thesis in Computer Engineering:** *Multi-robot fair target tracking with uncertain observations and mobility prediction*, 2013. Institution: Politecnico of Milan, Italy. Student: Jacopo Banfi.
6. **Supervisor for MSc. thesis in Informatics:** *A cooperative distributed protocol for link quality learning in wireless networks*, 2012. Institution: University of Lugano, Switzerland. Student: Imran Ahmed.
7. **Co-supervisor for Ph.D. in Informatics:** *Resilient path planning for multi-robot systems*, started in 2013. Institution: University of Lugano, Switzerland. Work in the context of the NCCR Robotics project “Resilient path planning for ground robots” (funded by Swiss NSF). Ph.D. student: Jérôme Guzzi.
8. **Co-supervisor for Ph.D. in Informatics:** *Cooperative planning in mixed swarms of humans, robots, and dogs for search and rescue*, started in 2011. Institution: University of Lugano, Switzerland. Work in the context of the “SWARMIX” Sinergia project (funded by Swiss NSF). Ph.D. student: Eduardo Feo.
9. **Supervisor for MSc. thesis in Informatics:** *Optimal relay node placement for throughput enhancement in wireless sensor networks*, 2010. Institution: joint programme of the Universities of Trento and Aachen. Student: Eduardo Feo.
10. **Co-supervisor for Ph.D. in Informatics:** *Human-swarm symbiotic interaction*, started in 2010. Institution: University of Lugano, Switzerland. Work in the context of the NCCR Robotics project “Symbiotic human-swarm interaction and cooperation” (funded by Swiss NSF). Ph.D. student: Jawad Nagi.
11. **Co-supervisor for MSc. thesis in Computer Science Engineering:** *Swarms of flying robots performing distributed path planning for objects on the ground*, 2010. Institution: Politecnico of Milano, Italy. Student: Andreagiovanni Reina.
12. **Co-supervisor for BSc. thesis in Management Engineering:** *Models and algorithms for lot-sizing problems*, 2009. Institution: University of Applied Science of Southern Switzerland, Lugano, Switzerland. Student: Franjo Majstorovic.

13. **Supervisor of Research Internship in Networking, 6 months:** *Adaptive routing in networks on-chip*, 2005. Student: Neha Bhargava.
14. **Co-supervisor for MSc. thesis in Bioinformatics:** *A computational model for the immune system and its aging*, 1999. Institution: Dpt. of Biology, Manchester University, UK. Student: Silvana Valensin.
15. **Co-supervisor for BEng. thesis in Electronics Engineering:** *Adaptive load balancing in telecommunications networks*, 1998. Institution: Politecnico of Milano, Italy. Student: Emanuele Persico.
16. **Co-supervisor for MSc. thesis in Physics:** *Study of the diversity of antibodies using genetic algorithms*, 1994. Institution: University of Bologna, Italy. Student: Silvana Valensin.

10. Invited Talks and Dissemination of Scientific Knowledge

- ◆ INVITED TALK: *Interaction, communication, and control in mixed teams of robot swarms and human agents*, at the techno-managerial festival **Pragyan '16, National Institute of Technology Tiruchirappalli (NIT-T), India**, February 27, 2016.
- ◆ INVITED TALK: *Swarm intelligence in the physical world*, at the techno-managerial festival **Technex'16, Indian Institute of Technology (BHU) Varanasi, India**, March 4, 2016.
- ◆ INVITED TALK: *Adaptive mission planning in mixed swarms*, **Navigare Workshop: Cooperative and Swarm Navigation**, Thun, Switzerland, organized by Swiss Institute of Navigation & Armasuisse, May, 2015.
- ◆ INVITED TALKS: *Swarm intelligence and mixed (robot) teams: Interaction, communication, and control*, at the **Indian Institutes of Technology (IIT) of Delhi, Kharagpur, and Roorkee**, tour organized by Swissnex India and Swiss Embassy in India, January 30 – February 6, 2015.
- ◆ INVITED TALK: *Collaborative mission planning and adaptive control in heterogeneous networked teams*, **2nd AETOS International Conference on “Research challenges for future RPAS/UAV systems”**, Bordeaux, France, September 9–10, 2014.
- ◆ INVITED TALK: *Human-swarm interaction*, **Towards a Swiss Robotics Rescue Team, Workshop at the IEEE International Conference on Robotics and Automation (ICRA)**, Karlsruhe, Germany, May 6–10, 2013.
- ◆ Special guest at the **TV science show “Il Giardino di Albert”**, on RSI 1, the official Italian-speaking broadcast TV of Switzerland, to talk about robotics, February 20th, 2012.
- ◆ INVITED TALK: *Power of the Swarm, in Natural, Simulation, and Robotic Worlds*, at the **International exhibition “Think Art–Act Science”**, **San Francisco Art Institute**, September 23, 2011.
- ◆ Interviewed by **The Economist** magazine, for the article *Riders on a swarm*, about swarm intelligence technologies, published on August 12th, 2010.
- ◆ Interviewed by the **Reflex magazine** (an EPFL-sponsored publication), for the 82-pages special issue on “Les secrets de l’intelligence”, published on May 2010.
- ◆ Participation to the research presented in **Swarmanoid, The Movie**, winner of the AAI-2011 Best Video Award, September 8th, 2011.

11. Scientific Publications

11.1 Refereed Journal Articles

1. A. Giusti, J. Guzzi, D. Ciresan, F. Lin, J. P. Rodríguez, F. Fontana, M. Faessler, C. Forster, J. Schmidhuber, G. A. Di Caro, D. Scaramuzza, and L. Gambardella. *A machine learning approach to the visual perception of forest trails for mobile robots*. IEEE ROBOTICS AND AUTOMATION LETTERS, 1(2):661–667, IEEE RAS, 2016.
2. G. A. Di Caro. *Principi di swarm intelligence per problemi di routing adattivo in reti di telecomunicazione*. SISTEMI INTELLIGENTI, 26(3):443–464, Il Mulino, December 2014. [In Italian].
3. A. Reina, L. M. Gambardella, M. Dorigo, and G. A. Di Caro. *zePPeLIN: Distributed path planning using an overhead camera network*. INTERNATIONAL JOURNAL OF ADVANCED ROBOTIC SYSTEMS, 11(119):1–22, InTech, 2014.
4. F. Ducatelle, G. A. Di Caro, A. Förster, M. Bonani, M. Dorigo, S. Magnenat, F. Mondada, R. O’Grady, C. Pinciroli, P. Réturnaz, V. Trianni, and L. M. Gambardella. *Cooperative navigation in robotic swarms*. SWARM INTELLIGENCE, 8(1):1–33, Springer, 2014.
5. A. Giusti, M. Salani, G. A. Di Caro, A. E. Rizzoli, and L. M. Gambardella. *Restricted neighborhood communication improves decentralized demand-side load management*. IEEE TRANSACTIONS ON SMART GRID, 5(1):92–101, IEEE, January 2014.
6. M. Dorigo, D. Floreano, L. M. Gambardella, F. Mondada, S. Nolfi, T. Baaboura, M. Birattari, M. Bonani, M. Brambilla, A. Brutschy, D. Burnier, A. Campo, A. L. Christensen, A. Decugnière, G. A. Di Caro, F. Ducatelle, E. Ferrante, A. Förster, J. Guzzi, V. Longchamp, S. Magnenat, J. Martinez Gonzales, N. Mathews, M. Montes de Oca, R. O’Grady, C. Pinciroli, G. Pini, P. Réturnaz, J. Roberts, V. Sperati, T. Stirling, A. Stranieri, T. Stützle, V. Trianni, E. Tuci, A. E. Turgut, and F. Vaussard. *Swarmanoid: A novel concept for the study of heterogeneous robotic swarms*. IEEE ROBOTICS & AUTOMATION MAGAZINE, 20(4):60–71, IEEE RAS, 2013.
7. M. Kudelski, L. M. Gambardella, and G. A. Di Caro. *RoboNetSim: An integrated framework for multi-robot and network simulation*. ROBOTICS AND AUTONOMOUS SYSTEMS, 61(5):483–496, Elsevier, 2013.
8. R. Montemanni, M. Mojana, G. A. Di Caro, and L. M. Gambardella. *A decomposition-based exact approach for the sequential ordering problem*. JOURNAL OF APPLIED OPERATIONAL RESEARCH (JAOR), 5(1):2–13, ORLab, 2013.
9. C. Pinciroli, V. Trianni, R. O’Grady, G. Pini, A. Brutschy, M. Brambilla, N. Mathews, E. Ferrante, G. A. Di Caro, F. Ducatelle, M. Birattari, L. M. Gambardella, and M. Dorigo. *ARGoS: A modular, parallel, multi-engine simulator for multi-robot systems*. SWARM INTELLIGENCE, 6(4):271–295, Springer, 2012.
10. F. Ducatelle, G.A. Di Caro, C. Pinciroli, and L. Gambardella. *Self-organized cooperation between robotic swarms*. SWARM INTELLIGENCE, 5(2):73–96, Springer, 2011.
11. M. Saleem, G.A. Di Caro, , and M. Farooq. *A review of swarm intelligence based routing protocols for wireless sensor networks*. INFORMATION SCIENCES, 181(20):4597–4624, Elsevier, October 2011.
12. F. Ducatelle, G.A. Di Caro, and L. Gambardella. *Principles and applications of swarm intelligence for adaptive routing in telecommunications networks*. SWARM INTELLIGENCE, 4(3):173–198, Springer, 2010.
13. G. A. Di Caro, S. Giordano, M. Kulig, D. Lenzarini, A. Puiatti, F. Schwitter, and S. Vanini. *Deployable application layer solution for seamless mobility across heterogeneous networks*. AD HOC & SENSOR WIRELESS NETWORKS, 4(1–2):1–42, Old City Publishing, 2007.
14. O. Babaoglu, G. Canright, A. Deutsch, G.A. Di Caro, F. Ducatelle, L.M. Gambardella, N. Ganguly, M. Jelasity, R. Montemanni, A. Montresor, and T. Urnes. *Design patterns from biology for distributed computing*. ACM TRANSACTIONS ON AUTONOMOUS AND ADAPTIVE SYSTEMS (TAAS), 1(1), ACM Press, September 2006.

15. G.A. Di Caro, F. Ducatelle, L.M. Gambardella, and A. Rizzoli. *Building blocks from biology for the design of algorithms for the management of modern dynamic networks*. EUROPEAN RESEARCH CONSORTIUM FOR INFORMATICS AND MATHEMATICS (ERCIM) NEWS, *Special Issue on Swarm Intelligence*, 64, ERCIM, January 2006.
16. G.A. Di Caro, F. Ducatelle, and L.M. Gambardella. *BISON: Biologically-inspired techniques for self-organization in dynamic networks*. KUENSTLICHE INTELLIGENZ, *Special Issue on Swarm Intelligence*, 4:36–39, Springer, November 2005.
17. F. Ducatelle, G.A. Di Caro, and L.M. Gambardella. *Using ant agents to combine reactive and proactive strategies for routing in mobile ad hoc networks*. INTERNATIONAL JOURNAL OF COMPUTATIONAL INTELLIGENCE AND APPLICATIONS, *Special Issue on Nature-Inspired Approaches to Networks and Telecommunications*, 5(2):169–184, World Scientific, June 2005.
18. G.A. Di Caro, F. Ducatelle, and L.M. Gambardella. *AntHocNet: an adaptive nature-inspired algorithm for routing in mobile ad hoc networks*. EUROPEAN TRANSACTIONS ON TELECOMMUNICATIONS, 16(5):443–455, Wiley-Blackwell, 2005.
19. G.A. Di Caro and M. Dorigo. *AntNet: Distributed stigmergetic control for communications networks*. A QUARTERLY IN ARTIFICIAL INTELLIGENCE, 12(3 & 4):2–37, Vivek Publication, 1999. Reprinted from JAIR.
20. M. Dorigo, G.A. Di Caro, and L. M. Gambardella. *Ant algorithms for discrete optimization*. ARTIFICIAL LIFE, 5(2):137–172, MIT Press, 1999.
21. G.A. Di Caro and M. Dorigo. *AntNet: Distributed stigmergetic control for communications networks*. JOURNAL OF ARTIFICIAL INTELLIGENCE RESEARCH (JAIR), 9:317–365, AI Access Foundation, 1998.
22. F. Valentinotti, G.A. Di Caro, and B. Crespi. *Real-time parallel computation of disparity and optical flow using phase difference*. MACHINE VISION AND APPLICATIONS, 9(3):87–96, Springer, 1996.
23. R. Campanini, G.A. Di Caro, M. Villani, I. D’Antone, and G. Giusti. *Parallel architectures and intrinsically parallel algorithms: Genetic algorithms*. INTERNATIONAL JOURNAL OF MODERN PHYSICS C, 5(1):95–112, World Scientific, 1994.
24. R. Campanini, I. D’Antone, G.A. Di Caro, and G. Giusti. *A transputer-based parallel expert diagnostic system*. PARALLEL COMPUTING, 19(6):685–692, Elsevier, 1993.

11.2 Book Chapters

1. G.A. Di Caro, F. Ducatelle, and L.M. Gambardella. *Routage dans les réseaux mobiles ad hoc en environnement urbain (in French, "Routing in urban mobile ad hoc networks")*. In N. Monmarché, F. Guinand, and P. Siarry, editors, FOURMIS ARTIFICIELLES 2, NOUVELLES DIRECTIONS POUR UNE INTELLIGENCE COLLECTIVE. Hermès Science Publications, France, 2009.
2. G.A. Di Caro, F. Ducatelle, and L.M. Gambardella. *Routing in urban mobile ad hoc networks (translated and reprinted from Hermès Science Publications)*. In N. Monmarché, F. Guinand, and P. Siarry, editors, ARTIFICIAL ANTS, page 576. Wiley-ISTE, 2010.
3. M. Farooq and G.A. Di Caro. *Routing protocols for next generation networks inspired by collective behaviors of insect societies: An overview*. In C. Blum and D. Merckle, editors, SWARM INTELLIGENCE: INTRODUCTION AND APPLICATIONS, Natural Computing. Springer, 2008.
4. G.A. Di Caro, F. Ducatelle, and L.M. Gambardella. *Theory and practice of Ant Colony Optimization for routing in dynamic telecommunications networks*. In N. Sala and F. Orsucci, editors, REFLECTING INTERFACES: THE COMPLEX COEVOLUTION OF INFORMATION TECHNOLOGY ECOSYSTEMS, pages 185–216. Idea Group, Hershey, USA, 2008.
5. M. Dorigo and G.A. Di Caro. *The ant colony optimization meta-heuristic*. In D. Corne, M. Dorigo, and F. Glover, editors, NEW IDEAS IN OPTIMIZATION, pages 11–32. McGraw-Hill, 1999.

11.3 Refereed Conference Papers, Videos, and Abstracts

1. B. Gromov, L. Gambardella, and G. A. Di Caro. *Wearable multi-modal interface for human multi-robot interaction*. In PROCEEDINGS OF THE 14TH IEEE INTERNATIONAL SYMPOSIUM ON SAFETY, SECURITY, AND RESCUE ROBOTICS (SSRR), Lausanne, Switzerland, October 23–27, 2016.
2. E. Feo-Flushing, L. Gambardella, and G. A. Di Caro. *Robot rostering: Coalition formation for long-term missions with work shifts*. In PROCEEDINGS OF THE 14TH IEEE INTERNATIONAL SYMPOSIUM ON SAFETY, SECURITY, AND RESCUE ROBOTICS (SSRR), Lausanne, Switzerland, October 23–27, 2016.
3. E. Feo-Flushing, L. Gambardella, and G. A. Di Caro. *On using mobile robotic relays for supporting data communications in search and rescue missions*. In PROCEEDINGS OF THE 14TH IEEE INTERNATIONAL SYMPOSIUM ON SAFETY, SECURITY, AND RESCUE ROBOTICS (SSRR), Lausanne, Switzerland, October 23–27, 2016.
4. J. Guzzi and G. A. Di Caro. *From indoor GIS maps to path planning for autonomous wheelchairs*. In PROCEEDINGS OF THE 29TH IEEE/RSJ INTERNATIONAL CONFERENCE ON INTELLIGENT ROBOTS AND SYSTEMS (IROS), Daejeon, South Korea, October 9–14, 2016.
5. B. Gromov, L. Gambardella, and G. A. Di Caro. *Wearable multi-modal interfaces for mixed-initiative interaction in human multi-robot teams*. In ICRA WORKSHOP ON FIELDED MULTI-ROBOT SYSTEMS OPERATING ON LAND, SEA, AND AIR (POSTER WITH EXTENDED ABSTRACT), Stockholm, Sweden, May 20, 2016.
6. R. Magán-Carrión, J. Camacho, P. Garcia-Teodoro, E. Feo-Flushing, and G. A. Di Caro. *Drns: Dynamical relay node placement solution*. In LNCS Springer, editor, PROCEEDINGS OF THE 14TH INTERNATIONAL CONFERENCE ON PRACTICAL APPLICATIONS OF AGENTS AND MULTI-AGENT SYSTEMS (PAAMS) – DEMONSTRATIONS TRACK, Sevilla, Spain, June 1–3, 2016.
7. E. Feo-Flushing, L. Gambardella, and G. A. Di Caro. *On decentralized coordination for spatial task allocation and scheduling in heterogeneous teams*. In PROCEEDINGS OF THE 15TH INTERNATIONAL CONFERENCE ON AUTONOMOUS AGENTS AND MULTIAGENT SYSTEMS (AAMAS), pages 988–996, Singapore, May 9–13, 2016.
8. A. Giusti, J. Guzzi, D. Ciresan, F.-L. He, J. P. Rodriguez, F. Fontana, M. Faessler, C. Forster, J. Schmidhuber, G. A. Di Caro, D. Scaramuzza, and L. M. Gambardella. *A machine learning approach to visual perception of forest trails for mobile robots*. In PROCEEDINGS OF THE IEEE INTERNATIONAL CONFERENCE ON ROBOTICS AND AUTOMATION (ICRA), Stockholm, Sweden, May 16–21, 2016.
9. SWARMIX project team (www.swarmix.org). *Finding Linda - A Search and Rescue Mission by SWARMIX*. In PROCEEDINGS OF THE 10TH AAAI VIDEO COMPETITION, Phoenix, AR, USA, February 12–17, 2016. (**Most Entertaining Video award**, and **Nominated for Best Video and Best Robot Video awards**).
10. A. Giusti, J. Guzzi, D. Ciresan, F.-L. He, J. P. Rodriguez, G. A. Di Caro, J. Schmidhuber, L. M. Gambardella, F. Fontana, M. Faessler, C. Forster, and D. Scaramuzza. *Quadcopter navigation in the forest*. In PROCEEDINGS OF THE 10TH AAAI VIDEO COMPETITION, Phoenix, AR, USA, February 12–17, 2016. (**Nominated for Best Robot Video award**).
11. J. Guzzi and G. A. Di Caro. *Towards supporting elderly’s orientation, mobility, and autonomy*. In WORKSHOP ON IMPROVING THE QUALITY OF LIFE IN THE ELDERLY USING ROBOTIC ASSISTIVE TECHNOLOGY: BENEFITS, LIMITATIONS, AND CHALLENGES - INTERNATIONAL CONFERENCE ON SOCIAL ROBOTICS (ICSR), Paris, France, October 30, 2015.
12. A. Giusti, J. Guzzi, D. Ciresan, F. Lin, J. P. Rodríguez, F. Fontana, M. Faessler, C. Forster, J. Schmidhuber, G. A. Di Caro, D. Scaramuzza, and L. Gambardella. *A machine learning approach to the visual perception of forest trails*. In IROS WORKSHOP ON VISION-BASED CONTROL AND NAVIGATION OF SMALL, LIGHTWEIGHT UAVS, Hamburg, Germany, October 2, 2015.

13. R. Magán-Carrión, J. Camacho, P. Garcia-Teodoro, E. Feo-Flushing, and G. A. Di Caro. *Dynamical relay node placement solution in MANETs*. In PROCEEDINGS OF THE 3RD IEEE INTERNATIONAL BLACK SEA CONFERENCE ON COMMUNICATIONS AND NETWORKING (BLACKSEACOM), DEMONSTRATION SESSION, Constanta, Romania, May 18–21, 2015.
14. J. Banfi, J. Guzzi, A. Giusti, L. Gambardella, and G. A. Di Caro. *Fair multi-target tracking in cooperative multi-robot systems*. In PROCEEDINGS OF THE IEEE INTERNATIONAL CONFERENCE ON ROBOTICS AND AUTOMATION (ICRA), Seattle, USA, May 26 – 30, 2015.
15. J. Nagi, H. Ngo, L. Gambardella, and G. A. Di Caro. *Wisdom of the swarm for human-swarm interaction*. In PROCEEDINGS OF THE IEEE INTERNATIONAL CONFERENCE ON ROBOTICS AND AUTOMATION (ICRA), Seattle, USA, May 26 – 30, 2015.
16. J. Nagi, F. Nagi, A. Giusti, L. Gambardella, and G. A. Di Caro. *Human-swarm localization: online learning of symmetric face poses*. In PROCEEDINGS OF THE IEEE INTERNATIONAL CONFERENCE ON IMAGE PROCESSING (ICIP), Paris, France, October 27–30, 2014.
17. E. Feo-Flushing, L. Gambardella, and G. A. Di Caro. *A mathematical programming approach to collaborative missions with heterogeneous teams*. In PROCEEDINGS OF THE 27TH IEEE/RSJ INTERNATIONAL CONFERENCE ON INTELLIGENT ROBOTS AND SYSTEMS (IROS), Chicago, IL, USA, September 14–18, 2014.
18. J. Nagi, A. Giusti, L. Gambardella, and G. A. Di Caro. *Human-swarm interaction using spatial gestures*. In PROCEEDINGS OF THE 27TH IEEE/RSJ INTERNATIONAL CONFERENCE ON INTELLIGENT ROBOTS AND SYSTEMS (IROS), Chicago, IL, USA, September 14–18, 2014.
19. F. Ghiringhelli, A. Giusti, J. Guzzi, G. A. Di Caro, V. Caglioti, and L. Gambardella. *Interactive augmented reality for understanding and analyzing multi-robot systems*. In PROCEEDINGS OF THE 27TH IEEE/RSJ INTERNATIONAL CONFERENCE ON INTELLIGENT ROBOTS AND SYSTEMS (IROS), Chicago, IL, USA, September 14–18, 2014.
20. A. Pesenti Gritti, O. Tarabini, A. Giusti, J. Guzzi, G. A. Di Caro, V. Caglioti, and L. Gambardella. *Kinect-based people detection and tracking from small-footprint ground robots*. In PROCEEDINGS OF THE 27TH IEEE/RSJ INTERNATIONAL CONFERENCE ON INTELLIGENT ROBOTS AND SYSTEMS (IROS), Chicago, IL, USA, September 14–18, 2014.
21. E. Feo-Flushing, M. Kudelski, L. Gambardella, and G. A. Di Caro. *Spatial prediction of wireless links and its application to the path control of mobile robots*. In PROCEEDINGS OF THE 9TH IEEE INTERNATIONAL SYMPOSIUM ON INDUSTRIAL EMBEDDED SYSTEMS (SIES), Pisa, Italy, June 18–20, 2014.
22. G. A. Di Caro, E. Feo-Flushing, and L. Gambardella. *Use of time-dependent spatial maps of communication quality for network-aware multi-robot path planning*. In PROCEEDINGS OF THE 8TH INTERNATIONAL WORKSHOP ON WIRELESS SENSOR, ACTUATOR AND ROBOT NETWORKS (WiSARN), Benidorm, Spain, June 22–27, 2014.
23. M. Kudelski, L. Gambardella, and G. A. Di Caro. *A mobility-controlled link quality learning protocol for multi-robot coordination tasks*. In PROCEEDINGS OF THE IEEE INTERNATIONAL CONFERENCE ON ROBOTICS AND AUTOMATION (ICRA), pages 5024–5032, Hong Kong, China, May 31 – June 5, 2014.
24. J. Nagi, A. Giusti, F. Nagi, L. Gambardella, and G. A. Di Caro. *Online feature extraction for the incremental learning of gestures in human-swarm interaction*. In PROCEEDINGS OF THE IEEE INTERNATIONAL CONFERENCE ON ROBOTICS AND AUTOMATION (ICRA), Hong Kong, China, May 31 – June 5, 2014.
25. H. Ngo, J. Nagi, L. Gambardella, J. Schmidhuber, and G. A. Di Caro. *Human-robot cooperation: fast, interactive learning from binary feedback*. In PROCEEDINGS OF THE 8TH ACM/IEEE INTERNATIONAL CONFERENCE ON HUMAN-ROBOT INTERACTION (HRI) (VIDEO SESSION), Bielefeld, Germany, March 3–6, 2014.
26. A. Pesenti Gritti, O. Tarabini, A. Giusti, J. Guzzi, G. A. Di Caro, V. Caglioti, and L. Gambardella. *Perceiving people from a low-lying viewpoint*. In PROCEEDINGS OF THE 8TH ACM/IEEE INTERNATIONAL CONFERENCE ON HUMAN-ROBOT INTERACTION (HRI) (VIDEO SESSION), Bielefeld, Germany, March 3–6, 2014.

27. J. Nagi, A. Giusti, G. A. Di Caro, and L. Gambardella. *HRI in the sky: Controlling UAVs using face poses and hand gestures*. In 8TH ACM/IEEE INTERNATIONAL CONFERENCE ON HUMAN-ROBOT INTERACTION (HRI) (LATE BREAKING REPORTS), Bielefeld, Germany, March 3–6, 2014.
28. G. A. Di Caro, A. Giusti, J. Nagi, and L. Gambardella. *A simple and efficient approach for cooperative incremental learning in robot swarms*. In PROCEEDINGS OF THE 16TH INTERNATIONAL CONFERENCE ON ADVANCED ROBOTICS (ICAR), Montevideo, Uruguay, November 25–29, 2013.
29. E. Feo-Flushing, L. Gambardella, and G. A. Di Caro. *Strategic control of proximity relationships in heterogeneous search and rescue teams*. In PROCEEDINGS OF THE 3RD IROS WORKSHOP ON ROBOTS AND SENSORS INTEGRATION IN FUTURE RESCUE INFORMATION SYSTEM (ROSIN), Tokyo, Japan, November 7, 2013.
30. J. Guzzi, A. Giusti, L. Gambardella, and G. A. Di Caro. *Local reactive robot navigation: a comparison between reciprocal velocity obstacle variants and human-like behavior*. In PROCEEDINGS OF THE 26TH IEEE/RSJ INTERNATIONAL CONFERENCE ON INTELLIGENT ROBOTS AND SYSTEMS (IROS), Tokyo Big Sight, Japan, November 3–8, 2013.
31. E. Feo-Flushing, M. Kudelski, L. Gambardella, and G. A. Di Caro. *Connectivity-aware planning of search and rescue missions*. In PROCEEDINGS OF THE 11TH IEEE INTERNATIONAL SYMPOSIUM ON SAFETY, SECURITY, AND RESCUE ROBOTICS (SSRR), Linköping, Sweden, October 21–26, 2013. (**Nominated for the Best Paper award**).
32. E. Feo-Flushing, M. Kudelski, J. Nagi, L. Gambardella, and G. A. Di Caro. *Link quality estimation: A case study for on-line supervised learning in wireless sensor networks (Extended abstract/poster)*. In PROCEEDINGS OF THE 5TH WORKSHOP ON REAL-WORLD WIRELESS SENSOR NETWORKS (REALWSN), Como Lake, Italy, September 19–20, 2013.
33. G. A. Di Caro, M. Kudelski, E. Feo-Flushing, J. Nagi, I. Ahmed, and L. Gambardella. *On-line supervised learning of link quality estimates in wireless networks*. In PROCEEDINGS OF THE 12TH IEEE/IFIP ANNUAL MEDITERRANEAN AD HOC NETWORKING WORKSHOP (MED-HOC-NET), pages 69–76, Ajaccio, France, June 24–26, 2013.
34. E. Feo-Flushing and G. A. Di Caro. *Relay node placement for performance enhancement with uncertain demand: a robust optimization approach*. In PROCEEDINGS OF THE 11TH INTERNATIONAL SYMPOSIUM ON MODELING AND OPTIMIZATION IN MOBILE, AD HOC, AND WIRELESS NETWORKS (WIOPT), pages 556–563, Tsukuba Science City, Japan, May 13–17, 2013.
35. J. Guzzi, A. Giusti, L. Gambardella, and G. A. Di Caro. *Human-friendly robot navigation in dynamic environments*. In PROCEEDINGS OF THE IEEE INTERNATIONAL CONFERENCE ON ROBOTICS AND AUTOMATION (ICRA), pages 423–430, Karlsruhe, Germany, May 6–10, 2013.
36. E. Feo-Flushing and G. A. Di Caro. *A flow-based optimization model for throughput-oriented relay node placement in wireless sensor networks*. In PROCEEDINGS OF THE 28TH ACM SYMPOSIUM ON APPLIED COMPUTING (SAC), NETWORKING TRACK, pages 632–639, Coimbra, Portugal, March 18–22, 2013.
37. E. Feo-Flushing and G. A. Di Caro. *Exploiting synergies between exact and heuristic methods in optimization: an application to the relay placement problem in wireless sensor networks*. In PROCEEDINGS OF THE 7TH INTERNATIONAL CONFERENCE ON BIO-INSPIRED MODELS OF NETWORK, INFORMATION, AND COMPUTING SYSTEMS (BIONETICS 2012), number 134 in Springer LNICST, pages 250–268, Lugano, Switzerland, December 10–11, 2014.
38. J. Guzzi, A. Giusti, L. Gambardella, and G. A. Di Caro. *Bioinspired obstacle avoidance algorithms for robot swarms*. In PROCEEDINGS OF THE 7TH INTERNATIONAL CONFERENCE ON BIO-INSPIRED MODELS OF NETWORK, INFORMATION, AND COMPUTING SYSTEMS (BIONETICS 2012), volume 134 of SPRINGER LNICST, pages 120–134, Lugano, Switzerland, December 10–11, 2014. (**Conference Best Paper award**).

39. J. Nagi, G. A. Di Caro, A. Giusti, , F. Nagi, and L. Gambardella. *Convolutional Neural Support Vector Machines: Hybrid visual pattern classifiers for multi-robot systems*. In PROCEEDINGS OF THE 11TH INTERNATIONAL CONFERENCE ON MACHINE LEARNING AND APPLICATIONS (ICMLA), Boca Raton, Florida, USA, December 12–15, 2012.
40. E. Feo-Flushing, L. Gambardella, and G. A. Di Caro. *GIS-based mission support system for wilderness search and rescue with heterogeneous agents*. In PROCEEDINGS OF THE 2ND IROS WORKSHOP ON ROBOTS AND SENSORS INTEGRATION IN FUTURE RESCUE INFORMATION SYSTEM (ROSIN), Vilamoura, Portugal, October 7–12, 2012.
41. A. Giusti, J. Nagi, L. Gambardella, and G. A. Di Caro. *Cooperative sensing and recognition by a swarm of mobile robots*. In PROCEEDINGS OF THE 25TH IEEE/RSJ INTERNATIONAL CONFERENCE ON INTELLIGENT ROBOTS AND SYSTEMS (IROS), pages 551–558, Vilamoura, Portugal, October 7–12, 2012.
42. M. Kudelski, M. Cinus, L. Gambardella, and G. A. Di Caro. *A framework for realistic simulation of networked multi-robot systems*. In PROCEEDINGS OF THE 25TH IEEE/RSJ INTERNATIONAL CONFERENCE ON INTELLIGENT ROBOTS AND SYSTEMS (IROS), pages 5018–5025, Vilamoura, Portugal, October 7–12, 2012.
43. J. Nagi, H. Ngo, A. Giusti, L. Gambardella, J. Schmidhuber, and G. A. Di Caro. *Incremental learning using partial feedback for gesture-based human-swarm interaction*. In PROCEEDINGS OF THE 21ST IEEE INTERNATIONAL SYMPOSIUM ON ROBOT AND HUMAN INTERACTIVE COMMUNICATION (RO-MAN), pages 898–905, Paris, France, September 9–13, 2012.
44. M. Mojana, R. Montemanni, G. A. Di Caro, and L. M. Gambardella. *A branch and bound approach for the sequential ordering problem*. In PROCEEDINGS OF THE 4TH INTERNATIONAL CONFERENCE ON APPLIED OPERATIONAL RESEARCH (ICAOR), *Bangkok, Thailand, July 25–27*, volume 4 of LECTURE NOTES IN MANAGEMENT SCIENCE, pages 266–273, 2012.
45. G. A. Di Caro, F. Ducatelle, and L. Gambardella. *A fully distributed communication-based approach for spatial clustering in robotic swarms*. In PROCEEDINGS OF THE 2ND AUTONOMOUS ROBOTS AND MULTI-ROBOT SYSTEMS WORKSHOP (ARMS), AFFILIATED WITH THE 11TH INTERNATIONAL CONFERENCE ON AUTONOMOUS AGENTS AND MULTIAGENT SYSTEMS (AAMAS), pages 153–171, Valencia, Spain, June 5, 2012.
46. A. Giusti, J. Nagi, L. Gambardella, and G. A. Di Caro. *Distributed consensus for interaction between humans and mobile robot swarms*. In PROCEEDINGS OF THE 11TH INTERNATIONAL CONFERENCE ON AUTONOMOUS AGENTS AND MULTIAGENT SYSTEMS (AAMAS), DEMONSTRATION TRACK, pages 1503–1504, Valencia, Spain, June 4–8, 2012.
47. F. Ducatelle, G. A. Di Caro, and L. Gambardella. *Spatial awareness in robotic swarms through local wireless communications (Extended abstract)*. In PROCEEDINGS OF THE 11TH INTERNATIONAL CONFERENCE ON AUTONOMOUS AGENTS AND MULTIAGENT SYSTEMS (AAMAS), pages 1205–1206, Valencia, Spain, June 4–8, 2012.
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