

# MARCO DORIGO'S CURRICULUM VITAE AND PUBLICATIONS LIST

IRIDIA  
UNIVERSITE LIBRE DE BRUXELLES  
BELGIUM



## HIGHLIGHTS

### Prizes

**Cajastur International Prize for Soft Computing**, awarded on November 27, 2007, by the Foundation for the Advancement of Soft Computing.

**Dr A. De Leeuw-Damry-Bourlart Award in Applied Sciences (Prix scientifique quinquennal du F.R.S.-FNRS)**, awarded on November 22, 2005, by the Belgian Fund for Scientific Research.

**Marie Curie Excellence Award**, awarded on November 5, 2003, by the European Commission.

**Italian Prize “Marco Somalvico” for Artificial Intelligence**, awarded on September 27, 1996, by the Italian association for artificial intelligence.

### Research funding

Since year 2000, he has been awarded more than nine millions EUR in research funding, of which more than five millions EUR for his research lab (the rest was for partner labs in European projects he coordinated).

### Citations

Many of his papers have received a number of citations well above the average.

From the Google Scholar database (May 2009):

- His *h*-number is 56.
- The total number of citations to his papers is more than 25,000. In particular, his paper IJ.10 received more than 3,000 citations, IJ.16 received more than 2,000 citations, and IJ.23 received more than 1,000 citations.
- His paper IJ.10 is the most cited paper published by the IEEE Trans. On Systems, Man, and Cybernetics in the last 20 years; his paper IJ.16 is the second most cited paper ever published by the IEEE Transactions on Evolutionary Computation; his paper IJ.23 is the most cited paper ever published by the journal Artificial Life (data obtained using the “Publish or Perish” open-source software).

From the Science Citation Index database (Oct 2008):

- Three of his papers (IJ.10, IJ.16, and IJ.23 in the publication list annexed) are in the top most cited 0.01% of all papers published both in Computer Science and in Engineering: IJ.10 received more than 1,400 citations, IJ.16 more than 1,000 citations, and IJ.23 more than 500 citations.
- Thirteen more of his papers (IJ.20, IJ.22 and IJ.24 in the publication list) are in the top most cited 1% of all papers published in Computer Science and Engineering.
- The total number of citations to his papers in the ISI Web of Science database more than 3,000.

### Editorial activities

**Editor-in-Chief** of the journal “Swarm Intelligence”.

**Associate editor** for nine international journals.

**Member of the editorial board** of seven international journals.

**Editor** of twelve books/proceedings/journal special issues.

**Member** of the program committee of 188 international conferences in the last ten years.

Started two series of successful international workshops (EWRL and ANTS).

## **Books**

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His book “Swarm Intelligence” has sold more than 8,000 copies, and has received more than 2,500 citations in Google Scholar.

His book “Ant Colony Optimization” has sold more than 5,000 copies in its English version; it was translated into Chinese (more than 4,000 copies sold), and it has received more than 1,100 citations in Google Scholar.

## **EDUCATION**

### **Habilitation**

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**Agrégé de l’Enseignement Supérieur** (qualification for university professorship) at the Applied Sciences Faculty, Université Libre de Bruxelles, Belgium, December 21, 1995.

**Dissertation title:** The Robot Shaping Approach to Behavior Engineering.

**Dissertation Committee:** Bernard Leduc (dean), Alain Delchambre, Pierre Gaspard, Raymond Hanus, Jean-Arcady Meyer (foreign expert), André Preumont, Philippe Smets.

### **Doctorate**

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**Doctorate** in Systems and Information Electronic Engineering, Politecnico di Milano, Italy, September 23, 1992.

**Dissertation title:** Ottimizzazione, apprendimento automatico, ed algoritmi basati su metafora naturale (Optimization, Learning, and Natural Algorithms).

**Dissertation Committee:** Maurelio Boari, Mario Refice, Domenico Saccà, Alberto Colorni, Alberto Bertoni, Marco Somalvico.

### **Master**

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**Laurea** (Master) in Industrial Technologies Engineering, Politecnico di Milano, Italy, June 11, 1986.

## **RESEARCH EXPERIENCE**

### **Research direction**

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Directs a group composed of:

- Four senior researchers: Dr. Mauro Birattari (FNRS research associate, tenured position), Dr. Thomas Stütze (FNRS research associate, tenured position), Dr. Manuel López-Ibáñez, and Dr. Ali Emre Turgut (post-doc).
- Twelve doctoral students.

### **Affiliations**

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IRIDIA, UNIVERSITE' LIBRE DE BRUXELLES, BELGIUM. Research director (Directeur de Recherches). Tenured position at the FNRS (Belgian National Fund for Scientific Research). Since Oct 2004.

IRIDIA, UNIVERSITE' LIBRE DE BRUXELLES, BELGIUM. Senior researcher (Maître de Recherches). Tenured position at the FNRS (Belgian National Fund for Scientific Research). Oct 2000 – Sep 2004.

IRIDIA, UNIVERSITE' LIBRE DE BRUXELLES, BELGIUM. Associate researcher (Chercheur qualifié). Tenured position at the FNRS (Belgian National Fund for Scientific Research). Oct 1996 – Sep 2000.

IDSIA, ISTITUTO DALLE MOLLE, LUGANO, SWITZERLAND. Researcher in artificial intelligence and robotics. Jun 1996 – Sep 1996.

IRIDIA, UNIVERSITE' LIBRE DE BRUXELLES, BELGIUM. Marie Curie post-doctoral researcher in artificial intelligence with Prof. Philippe Smets. Aug 1994 – May 1996.

IDSIA, ISTITUTO DALLE MOLLE, LUGANO, SWITZERLAND. Researcher in artificial intelligence and robotics. Jun 1994 – Jul 1994.

IRIDIA, UNIVERSITE' LIBRE DE BRUXELLES, BELGIUM. NATO-CNR post-doctoral researcher in artificial intelligence with Prof. Philippe Smets. Jul 1993 – May 1994.

POLITECNICO DI MILANO ARTIFICIAL INTELLIGENCE AND ROBOTICS PROJECT, DIPARTIMENTO DI ELETTRONICA E INFORMAZIONE, POLITECNICO DI MILANO. Researcher in artificial intelligence. Apr 1993 – Jun 1993.

INTERNATIONAL COMPUTER SCIENCE INSTITUTE, BERKELEY, CALIFORNIA. Post-doctoral researcher in artificial intelligence, with Prof. Jerome Feldman. Apr 1992 – Mar 1993.

POLITECNICO DI MILANO ARTIFICIAL INTELLIGENCE AND ROBOTICS PROJECT, DIPARTIMENTO DI ELETTRONICA E INFORMAZIONE, POLITECNICO DI MILANO. Researcher in artificial intelligence. Nov 1991 – Mar 1992.

POLITECNICO DI MILANO ARTIFICIAL INTELLIGENCE AND ROBOTICS PROJECT, DIPARTIMENTO DI ELETTRONICA E INFORMAZIONE, POLITECNICO DI MILANO. Graduate student in Systems and Information Electronic Engineering with Prof. Alberto Colorni and Prof. Marco Somalvico. Nov 1988 – Oct 1991.

POLITECNICO DI MILANO ARTIFICIAL INTELLIGENCE AND ROBOTICS PROJECT, DIPARTIMENTO DI ELETTRONICA E INFORMAZIONE, POLITECNICO DI MILANO. Graduate researcher with Prof. Marco Somalvico. Jan 1988 – Oct 1988.

MARIO NEGRI INSTITUTE FOR PHARMACOLOGICAL RESEARCH, MILANO. Researcher in artificial intelligence with Prof. Stefano Cerri. May 1986 – Dec 1987.

### **Short visits to foreign laboratories**

INSTITUT D'INVESTIGACIO EN INTEL.LIGENCIA ARTIFICIAL, CSIC-SPANISH SCIENTIFIC RESEARCH COUNCIL, BELLATERRA, CATALONIA, SPAIN. Visiting professor. May 2002 - Aug 2002.

INTERNATIONAL COMPUTER SCIENCE INSTITUTE, BERKELEY, CALIFORNIA. Visiting scientist. Mar 1996 - Apr 1996.

IDSIA, ISTITUTO DALLE MOLLE, LUGANO, SWITZERLAND. Visiting scientist. Jun 1995 - Aug 1995.

I3S, CNRS, SOPHIA ANTIPOLIS, NICE, FRANCE. Visiting scientist. Apr 1995.

GMD, SANKT AUGUSTIN. Visiting researcher. Summer 1991.

TECHNISCHE UNIVERSITÄT MÜNCHEN. Graduate researcher in artificial intelligence with Professor W. Brauer. Jul 1989 - Dec 1989, and Apr 1990.

## TEACHING EXPERIENCE

### Professor

UNIVERSITE' LIBRE DE BRUXELLES, BELGIUM. Professor of "Swarm Intelligence." Master course (4 ECTS) started in academic year 2008-09.

POLITECNICO DI MILANO AT CREMONA, ITALY. Professor (one-year contract) of "Knowledge Engineering and Expert Systems." Sep 1994 - Aug 1995.

POLITECNICO DI MILANO AT CREMONA, ITALY. Professor (one-year contract) of "Knowledge Engineering and Expert Systems." Sep 1993 - Aug 1994.

### Teaching Assistant

DIPARTIMENTO DI ELETTRONICA E INFORMAZIONE, POLITECNICO DI MILANO. Taught lessons and graded papers for Introduction to Computer Science, Industrial Electronics, and Operation Research. I have supervised many students as a teaching assistant in the following courses at Politecnico of Milano: Advanced Computer Languages, Artificial Intelligence, Robotics. Nov 1988 - Mar 1992.

### Post Doctoral researchers under supervision

Dr. Manuel López-Ibáñez	Mar	2009	–	...	
Dr. Ali Emre Turgut	Nov	2008	–	...	
Dr. Elio Tuci	Nov	2003	–	Mar	2008
Dr. Hussain Saleh	Oct	2001	–	Sep	2003 (Marie Curie fellow)
Dr. Erol Sahin	Oct	2001	–	Oct	2002
Dr. Joshua Knowles	Sep	2001	–	Aug	2003 (Marie Curie fellow)
Dr. Michael Sampels	Apr	2001	–	Mar	2003
Dr. Stefka Fidanova	Nov	2000	–	Oct	2002 (Marie Curie fellow)
Dr. Nicolas Meuleau	Nov	2000	–	Nov	2001 (Marie Curie fellow)
Dr. Thomas Stütze	Dec	1998	–	Feb	2000 (Marie Curie fellow)

### Ph.D. Students under supervision

Alessandro Stranieri	since 2010
Manuele Brambilla	since 2009
Sabrina Oliveira	since 2008
Antal Decugnière	since 2008
Nithin Mathews	since 2008
Eliseo Ferrante	since 2007
Arne Brutschy	since 2007
Giovanni Pini	since 2007
Carlo Pinciroli	since 2006
Marco Montes de Oca	since 2005
Alexandre Campo	since 2004
Rehan O'Grady	since 2004

### Supervised Ph.D. Students who have received their doctorate

Prasanna Balakrapash	Ph.D. awarded on January 26, 2010
Christos Ampatzis	Ph.D. awarded on November 10, 2008, now researcher at the European Space Agency, Noordwijk, The Netherlands

Shervin Nouyan	Ph.D. awarded on September 24, 2008, now researcher at Volvo, Germany
Anders Christensen	Ph.D. awarded on June 27, 2008, now assistant professor at University of Lisbon
Krzysztof Socha	Ph.D. awarded on May 9, 2008, now independent consultant in computer security, Belgium
Roderich Groß	Ph.D. awarded on October 12, 2007, now Marie Curie researcher at the École Polytechnique Fédérale de Lausanne, Switzerland
Thomas H. Labella	Ph.D. awarded on February 9, 2007, now researcher at Elektrobit Automotive Software, Erlangen, Germany
Leonora Bianchi	Ph.D. awarded on June 29, 2006, now researcher at IDSIA, Università di Lugano, Switzerland
Vito Trianni	Ph.D. awarded on June 26, 2006, now researcher at ISTC, CNR, Rome, Italy
Mauro Birattari	Ph.D. awarded on December 20, 2004, now FNRS research associate at IRIDIA, Université Libre de Bruxelles
Gianni Di Caro	Ph.D. awarded on November 10, 2004, now researcher at IDSIA, Università di Lugano, Switzerland
Christian Blum	Ph.D. awarded on February 6, 2004, now researcher at Universidad Polytechnica de Catalunya, Barcelona, Spain

#### **Visiting Ph.D. Students under supervision**

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Levent Bayindir (Middle East Technical University, Ankara, Turkey)	May 2009 – April 2010
Francesco Sambo (Università di Padova, Italy)	Oct 2008 – Jul 2009
Fabio Rossi (Università di Perugia, Italy)	Jun 2008 – Aug 2008
Navneet Bhalla (University of Calgary, Calgary, Canada)	Oct 2007 – Mar 2008
Alvaro Gutiérrez (Universidad Politécnica de Madrid, Spain)	Jun 2007 – Nov 2007
Giacomo Di Tollo (Università di Chieti, Italy)	Jan 2007 – Jun 2007
Jodelson Sabino (Pontificia Universidade Católica do Rio de Janeiro, Brazil)	Oct 2005 – Sep 2006
Stephen Gilmore (Macquarie University, Sydney, Australia)	Sep 2005 – Oct 2005
Federico Vicentini (Politecnico di Milano, Italy)	Jun 2005 – Dec 2005
Paola Pellegrini (Università di Venezia, Italy)	Jan 2005 – Dec 2005
Michael Bonani (EPFL, Lausanne, Switzerland)	Sep 2004 – Mar 2005
Elio Tuci (University of Sussex, UK)	Nov 2002 – Jun 2003
Carlotta Piscopo (Univ. Pol. Catalunya, Spain)	Sep 2002 – Aug 2003
Morgan Tamplin (University of Edinburgh, UK)	May 2002 – Apr 2003
Vito Trianni (Politecnico di Milano, Italy)	Oct 2001 – Sep 2002
Mark Zlochinn (Technion, Haifa, Israel)	Jun 2001 – May 2002
Andrea Roli (Università di Bologna, Italy)	Nov 2000 – May 2001

## PhD Committees

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**Foreign expert** in the examination committee for the:

- Ph.D. defense by Alvaro Gutiérrez at the University of Madrid, Spain, 2009.
- Ph.D. defense by Stefan Janson at the University of Leipzig, Germany, 2007.
- “Diplôme d'habilitation a diriger des recherches” defense by Christine Solnon at the University of Lyon, France, Dec 6, 2005.
- Ph.D. defense by Marco Wiering at the University of Amsterdam, The Netherlands, Feb 17, 1999.
- Ph.D. defense by Simon Perkins at the University of Edinburgh, United Kingdom, Feb 1, 1999.
- “Diplôme d'habilitation a diriger des recherches” defense by Philippe Collard at the University of Nice, France, Jan 22, 1999.
- Ph.D. defense by Thomas Stützle at the University of Darmstadt, Germany, Dec 9, 1998.
- Ph.D. defense by Jean-Yves Donnart at the Ecole Normale Supérieure, Paris, France, Feb 16, 1998.
- “Diplôme d'habilitation a diriger des recherches” defense by Gilles Venturini at the University of Tours, France, Dec 20, 1997.
- Ph.D. defense by Olivier Michel at the University of Nice-Sophia Antipolis, France, Nov 27, 1996.
- Ph.D. defense by Dominique Snyers at the University of Caen, France, Feb 28, 1996.

**Member** of the examination committee for the:

- Ph.D. defense by Koen Mertens at the Katholieke Universiteit Leuven, Dec 8, 2006.
- Ph.D. defense by Elzbieta Malinowski at the Université Libre de Bruxelles, Belgium, Oct 2, 2006.
- Ph.D. defense by Gianluca Bontempi at the Université Libre de Bruxelles, Belgium, Dec 22, 1999.
- Ph.D. defense by Alessandro Saffiotti at the Université Libre de Bruxelles, Belgium, Oct 1, 1998.

## Master Students

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Luca Angaroni, Massimiliano Bolondi, Massimo Bondanza, Manuele Brambilla, Laurent Bury, Pierguido Caironi, Marco Cecchet, Abdelkader Chouaya, Marcello Cirillo, Olivier Colot, Luca Concetti, Curzio Cossandi, Maurizio Cottarelli, Francesco Cuffaro, Denis Darquenne, Antal Decugnière, Olivier Dédriche, Matthijs den Besten, Antoine Dubois, Marco Faini, Pierre-Alain François, Roberto Ghizzioli, Alessandro Gobbi, Julia Handl, Stefano Lanza, Andrea Maesani, Sebastien Magdelyns, Max Manfrin, Michael Maur, Leo Mazzone, Patrick Meyer, Stefano Michi, Shervin Nouyan, Roberto Pellagatti, Emanuele Persico, Giovanni Pini, Roberto Piroddi, Domenico Riboli, Luigi Romanelli, Rino Rusconi, Enrico Sirtori, David Tran-Dinh, Truc Huynh Trung, Colin Twomey, Pietro Valente, Mouhcine Zekkri.

## Invited tutorials

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**Tutorial speaker** on “An Introduction to Swarm Intelligence” at the “2nd International Seminar on New Issues in Artificial Intelligence,” Universidad Carlos III de Madrid, Spain (Feb 6, 2009).

**Tutorial speaker** on “Ant Colony Optimization: An Introduction” at the “International Conference on Metaheuristics and Nature Inspired Computing,” Hammamet, Tunisia (Oct 29, 2008).

**Speaker** on “Swarm intelligence with applications in optimization and robotics” at “DECOI2007–International Summer School on Collective Intelligence and Evolution”, Amsterdam, The Netherlands (Aug 20, 2007).

**Tutorial speaker** on “An Introduction to Ant Colony Optimization and Swarm Intelligence” at the “Ninth International Conference on Parallel Problem Solving From Nature (PPSN IX),” Reykjavik, Iceland (Sep 10, 2006).

**Tutorial speaker** on “Ant Colony Optimization” at the “Sixth Metaheuristics International Conference (MIC 2005),” Vienna, Austria (Aug 22, 2005).

**Tutorial speaker** on “Fundamentals and Applications of Ant Colony Optimization” at the “IEEE Swarm Intelligence Symposium (IEEE-SIS 2005),” Pasadena, CA (Jun 8, 2005).

**Tutorial speaker** on “An Introduction to Ant Colony Optimization and Swarm Intelligence” at the “Eighth International Conference on Parallel Problem Solving From Nature (PPSN VIII),” Birmingham, UK (Sep 19, 2004).

**Tutorial speaker** on “Ant Colony Optimization and Swarm Intelligence: An Introduction” at the “Fourth International Workshop on Ant Colony Optimization and Swarm Intelligence (ANTS 2004),” Brussels, Belgium (Sep 5, 2004).

**Tutorial speaker** on “An Introduction to Ant Algorithms and Swarm Intelligence” at the “European Conference on Artificial Intelligence (ECAI 2002),” Lyon, France (22 Jul, 2002).

**Tutorial speaker** on “Ant Colony Optimization” at the EvoNet Summer School, Thessaloniki, Greece (Aug 27 – 1 Sep, 2001).

**Tutorial speaker** on “Ant Algorithms and Swarm Intelligence” at IJCAI-01 – Seventeenth International Joint Conference on Artificial Intelligence, Seattle, WA, USA (Aug 6, 2001).

**Tutorial speaker** on “Ant Colony Optimization and Swarm Intelligence” at the Santa Fe Complex Systems Summer School, Budapest, Hungary (25 Jul, 2001).

**Tutorial speaker** on “An Introduction to Ant Algorithms” at the “Joint tutorials of SAB 2000 and PPSN 2000,” Paris, France (17 Sep, 2000).

**Tutorial speaker** on “Ant Algorithms and Swarm Intelligence: An Introduction” at the “European Conference on Artificial Intelligence (ECAI 2000),” Berlin, Germany (21 Aug, 2000).

**Tutorial speaker** on “Ant Algorithms” at the “2000 Genetic and Evolutionary Computation Conference (GECCO-2000),” Las Vegas, USA (9 Jul, 2000).

**Tutorial speaker** on “An Introduction to Ant Algorithms” at the “9th Belgian-Dutch Conference on Machine Learning (BENELEARN-99),” Maastricht, The Netherlands (Nov 5, 1999).

**Tutorial speaker** on “An Introduction to Ant Algorithms” at the “5th European Conference on Artificial Life (ECAL99),” Swiss Federal Institute of Technology (EPFL), Lausanne, Switzerland (Sep 13, 1999).

**Tutorial speaker** on “Introduction to Ant Colony Optimization” at the “1999 Genetic and Evolutionary Computation Conference (GECCO-99),” Orlando, FL, USA (14 Jul, 1999).

**Tutorial speaker** on “Artificial Life: The Swarm Intelligence Approach” at the “IEEE 1999 International Congress On Evolutionary Computation,” Washington D.C., USA (Jul 6, 1999).

**Tutorial speaker** at the Artificial Intelligence and Beyond course, organized by the Flanders Language Valley Education and K.U. Leuven Campus Kortrijk, Apr 14, 1999.

**Tutorial speaker** on “Ant Colony Optimization” at the “Fifth International Conference on Parallel Problem Solving From Nature (PPSN V),” Amsterdam, The Netherlands (Sep 27, 1998).

**Tutorial speaker** on “Ant Colony Optimization” at the “Third Annual Genetic Programming Conference - GP-98,” University of Wisconsin, Madison, WI, USA (Jul 22-25, 1998).

### Teaching text books

**Co-author** of a text book in mechanics (Buccino, Dorigo, Garavaglia, Esercizi di Statica, Clup). The book has been used for at least ten years by engineering and architecture students at Politecnico of Milano. 1986.

## AWARDS AND HONORS

### Scientific prizes

**Cajastur International Prize for Soft Computing**, awarded on November 27, 2007, by the Foundation for the Advancement of Soft Computing “in consideration of his outstanding contributions to the advancement of soft computing by developing the ant colony optimization (ACO) methodology” (20,000 EUR; see <http://www.softcomputing.es/en/detailnew.php?cod=175>).

**IEEE TEC Outstanding Paper Award (bestowed in 2007)** for the paper “Search Bias in Ant Colony Optimization: On the Role of Competition-Balanced Systems,” IEEE Transactions on Evolutionary Computation, 9(2):159–174, April 2005 (1,000 USD; see <http://iee-cis.org/awards/nominations/#TECOutstandingPaperAward>; awarded on June 3, 2008).

**Best Video Award**, awarded by the Association for the Advancement of Artificial Intelligence at the AAI-2007 International Conference held in Vancouver, Canada, July 23, 2007 (100 CND and “Shakey” trophy; see <http://www.aivideo.org/2007>).

**Dr A. De Leeuw-Damry-Bourlart Award in Applied Sciences**, awarded on November 22, 2005, by the Belgian Funds for Scientific Research for “his fundamental contributions to the foundation of the new, biologically inspired, area of swarm intelligence along with successful applications in operations research (through the invention of the ant colony optimization metaheuristic), in robotics (in the form of swarm-bots) and in artificial intelligence” (75,000 EUR; see <http://www1.fnr.be/3-financement/4-presse/00a.html>).

**Best Paper Award** awarded on March 12, 2004, at the Eight Conference on Intelligent Autonomous Systems (IAS-8), Amsterdam, The Netherlands, for the paper: “Hole Avoidance: Experiments in Coordinated Motion on Rough Terrain”, co-authored with Vito Trianni and Stefano Nolfi. (2004).

**European Prize “Marie Curie Excellence Award”**, awarded on November 5, 2003, by the European Commission for his work on “Ant colony optimization and ant algorithms” (50,000 EUR; see [http://ec.europa.eu/research/fp6/mariecurie-actions/news/headline20\\_en.html](http://ec.europa.eu/research/fp6/mariecurie-actions/news/headline20_en.html)).

**Italian Prize “Marco Somalvico” for Artificial Intelligence**, awarded on September 27, 1996 (5,000 EUR; see <http://sites.google.com/a/aixia.it/vincitori-premi/>).



## **Award committee**

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Member of the IEEE Frank Rosenblatt Award Committee (May 2007–May 2010)  
Member of the IEEE Fellow Committee (2008)

## **Fellow**

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Named **Fellow of the European Coordinating Committee for Artificial Intelligence (ECCAI)** (since June 28th, 2007).

Named **Fellow of the Institute of Electrical and Electronics Engineers (IEEE)** (since January 1<sup>st</sup>, 2006).

## **Tenured positions**

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**Winner** of a tenured position as assistant professor at Politecnico di Milano (December 1995). Position not accepted (in order to accept the position offered by the FNRS at the Université Libre de Bruxelles).

## **Professorship**

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Inscribed in the list of persons **qualified for the function of university professor** in France (since Feb 16, 1995).

## **Research awards**

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**ERC Advanced Grant** for the project “E-SWARM: Engineering Swarm Intelligence Systems” 2010-2015. Funding: 2,016,000 EUR.

**F.R.S-FNRS research award** for the project “Swarm-Morph”. 2009-2013. Funding: 15,000 EUR.

**“Action de Recherche Concertée” (ARC) research award** for the project “Meta-X: Metaheuristics for Complex Optimization Problems”. 2008-2013. Funding: 650,000 EUR.

**Coordinator** of the project “Evolving a collective consciousness for a swarm of pico-satellites” funded by the ARIADNA program of the European Space Agency. 2007 (4 months). Funding: 26,000 EUR.

**FNRS research award** for the project “Virtual Swarmanoid”. 2007-2008. Funding: 40,000 EUR.

**Coordinator** of the project “Swarmanoid: Towards Humanoid Robotic Swarms”, funded by the European Union within the Future and Emerging Technologies (IST-FET) program. 2006-2010 (42 months). Total grant: 2,500,000 EUR; IRIDIA share of grant: 970,000 EUR.

**Coordinator** of the European project “COMP2SYS: COMPUTational intelligence methods for COMPLEX SYSTEMS” an Early Stage Training project funded by the European Commission within the Marie Curie Activities program. 2004-2008 (48 months). Total grant: 1,000,000 EUR; IRIDIA share of grant: 1,000,000 EUR.

**Partner** of the “ECAgents: Embodied and Communicating Agents” project, funded by the European Union within the Future and Emerging Technologies (IST-FET) program. 2004-2008. Total grant: 5,000,000 EUR; IRIDIA share of grant: 250,000 EUR.

**“Action de Recherche Concertée” (ARC) research award** for the project “ANTS: Towards a Foundation of Ant Algorithms”. 2003-2008. Funding: 500,000 EUR.

**FNRS research award** for the project “Virtual Swarm-bots”. 2002-2003. Funding: 37,000 EUR.

**Coordinator** of the project “Swarm-bots: Swarms of self-assembling artefacts”, funded by the European Union within the Future and Emerging Technologies (IST-FET) program. 2001-2005 (42 months). Total grant: 1,970,000 EUR; IRIDIA share of grant: 800,000 EUR.

**Coordinator** of the European “Metaheuristics Network” funded by the European Union within the Improving Human Potential program. 2000-2004 (48 months). Total grant: 1,200,000 EUR; IRIDIA share of grant: 360,000 EUR.

**Coordinator** of the European “Marie Curie Training Site” funded by the European Union within the Improving Human Potential program. 2000-2004 (48 months). Funding: 158,000 EUR.

**FNRS research award** for building a “Beowulf” style cluster of PCs. 2000-2001. Funding: 17,000 EUR.

**Scientist in charge and research director** for:

- a 24 months Marie Curie postdoctoral fellowship awarded to Dr. Joshua Knowles by the EC funded Improving Human Potential programme. Funding: 152,000 EUR.
- a 18 months Marie Curie postdoctoral fellowship awarded to Mr. Gianni Di Caro by the EC funded Improving Human Potential programme. Funding: 114,000 EUR.
- a 24 months Marie Curie postdoctoral fellowship awarded to Dr. Hussain Saleh by the EC funded Improving Human Potential programme. Funding: 152,000 EUR.
- a 24 months Marie Curie postdoctoral fellowship awarded to Dr. Stefka Fidanova by the EC funded Improving Human Potential programme. Funding: 152,000 EUR.
- a 24 months Marie Curie postdoctoral fellowship awarded to Dr. Nicolas Meuleau by the EC funded Improving Human Potential programme. Funding: 152,000 EUR.
- a 30 months Marie Curie doctoral fellowship awarded to Gianni Di Caro by the EC funded TMR programme. Funding: 150,000 EUR.
- a 15 months Marie Curie doctoral fellowship awarded to Thomas Stützle by the EC funded TMR programme. Funding: 75,000 EUR.

**Local coordinator** (IRIDIA, since 2002) for the Network of Excellence in Complex Systems (Exystence) funded by the Commission of the European Community.

**Local coordinator** (IRIDIA, since 1996) for the Network of Excellence in Evolutionary Computation (EvoNet) funded by the Commission of the European Community.

**Local coordinator** (IRIDIA, since 1996) for the Network of Excellence in Machine Learning (MLnet) funded by the Commission of the European Community.

**Local coordinator** (1990-92, PM AI&R, Politecnico di Milano) of the activities which led first to the formulation of a proposal, and then to the administration of the project, for the Italian “Progetto Finalizzato Informatica e Calcolo Parallelo - Obiettivo Processori Dedicati.”

## **Various**

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“SWARM-BOTS”, a project funded by the Commission and coordinated by Dr. Dorigo (2001-2005), was selected as one of the **success stories** of the Future and Emerging Technologies programme.

Dr. Dorigo's Marie Curie fellowship results have been selected by the European Commission as one of the “**Marie Curie Fellowships Success Stories**” (document EUR 17763 published by the European Commission in December 1997).

Elected **Senior Member** in the IEEE (Institute of Electrical and Electronics Engineers) on Sep 28, 1996.

## **Invited talks**

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**Invited speaker** on "Swarm Intelligence in the Natural and Artificial Worlds" at "Studium Generale", Maastricht University, The Netherlands, March 15, 2010.

**Invited keynote speaker** on “Swarms of Physically Cooperating Robots” at “Congress of the Italian Association for Artificial Intelligence”, Reggio Emilia, Italy, December 10, 2009.

**Invited keynote speaker** on "From social insects to swarms of robots: The Swarm-bots experiment" at "Inside", Lisbon, Portugal, November 7, 2009.

**Invited keynote speaker** on "Swarm Robotics" at "Modelling Cognitive Behaviour - 2009", Bristol, UK, November 5, 2009.

**Invited keynote speaker** on “Swarms of cooperating robots” at “ICAIS'09 – International Conference on Adaptive and Intelligent Systems”, Klagenfurt, Austria, September 26, 2009.

**Invited keynote speaker** on “Swarm-bots and Swarmanoid: Two experiments in embodied swarm intelligence” at the “2009 IEEE/WIC/ACM International Conference on Intelligent Agent Technology (IAT 2009) and 2009 IEEE/WIC/ACM International Conference on Web Intelligence (WI 2009),” Milano, Italy, September 17, 2009.

**Invited keynote speaker** on “Embodied Swarm Intelligence: The Swarm-bot and the Swarmanoid Experiments” at “ICANN 2009 – The 19th International Conference on Artificial Neural Networks”, Limassol, Cyprus, September 15, 2009.

**Invited keynote speaker** on “Swarm Intelligence, Swarm-bots and Swarmanoids” at “ICCSA 2009 – The 3rd International Conference on Complex Systems and Applications”, University of Le Havre, France, June 29, 2009.

**Invited keynote speaker** on “Morphogenesis in Swarm-bots” at “MEW2009 - First International Workshop on Morphogenetic Engineering”, Complex Systems Institute, Paris, June 19, 2009.

**Invited plenary speaker** on “Swarm Intelligence” at “Biowire09 – From Self-Organisation in Living Systems to Sensor and Wireless Networks”, Cambridge, UK, June 11, 2009.

**Invited speaker** on “Swarm-bot: An Experiment in Embodied Swarm Intelligence” at “Informatikkolloquium”, Universität Paderborn, Germany, May 5, 2009.

**Invited keynote speaker** on “Swarm-bots and Swarmanoids” at “EURON 2009 – European Robotics Research Network Annual Meeting”, Leuven, Belgium, April 7, 2009.

**Invited speaker** on “The Swarm-bot Experience in Swarm Robotics” at “Seminar series on Systems and Control”, Université Catholique de Louvain, Belgium, March 31, 2009.

**Invited keynote speaker** on “Swarm-bots” at “ICAART 2009 – International Conference on Agents and Artificial Intelligence”, Porto, Portugal, January 20, 2009.

**Invited plenary speaker** on “Swarm intelligence and swarm-bots” at “Celebration for the 20 years of the Istituto Dalle Molle di studi sull'intelligenza artificiale – IDSIA”, Palazzo dei Congressi, Lugano, Switzerland, October 24, 2008.

**Invited plenary speaker** on “Swarm robotics: the coordination of robots via swarm intelligence principles” at “BICC 2008 – 2nd IFIP Conference on Biologically Inspired Collaborative Computing”, Milano, Italy, September 8, 2008.

**Invited plenary speaker** on “The Swarm-bot: a swarm of self-assembling robots” at “IPMU 2008 – 12th International Conference Information Processing and Management of Uncertainty for Knowledge-Based Systems”, Malaga, Spain, June 26, 2008.

**Invited plenary speaker** on “Swarm Intelligence and Swarm Robotics: The Swarm-bot Experiment” at “ICINCO 2008 – International Conference on Informatics in Control, Automation and Robotics”, Funchal, Madeira, Portugal, May 12, 2008.

**Invited plenary speaker** on “Swarm Robotics: The Application of Swarm Intelligence Principles to the Control of Swarms of Robots” at “BIONETICS 2007 – 2nd International Conference on Bio-Inspired Models of Network, Information, and Computing Systems”, Budapest, Hungary, December 10, 2007.

**Invited plenary speaker** on “Swarm-bots: An Experiment in Swarm Robotics” at “NISCO 2007 – Second International Workshop on Nature Inspired Cooperative Strategies for Optimization”, Acireale (Catania), Italy, November 8, 2007.

**Invited plenary speaker** on “Swarms of Self-assembling Robots” at the “International Conference on Complex Systems–Engineering Environment-Mediated Multiagent Systems”, Dresden, Germany, October 5, 2007.

**Invited speaker** on “Swarm-bots: Swarms of Self-assembling Robots” at the “Summer research institute–EPFL”, Lausanne, Switzerland, July 3, 2007.

**Invited plenary speaker** on “Swarm-bots: Swarms of Self-assembling Robots” at the “International Symposium on Innovations in Intelligent Systems and Applications–INISTA 2007”, Istanbul, Turkey, June 21, 2007.

**Invited speaker** on “The Swarm-bot experiment in swarm robotics” at the University of Amsterdam, Amsterdam, The Netherlands, November 20, 2006.

**Invited speaker** on “Swarm intelligence and its use in swarm robotics” at the European Space Agency, Noordwijk, The Netherlands, November 17, 2006.

**Invited plenary speaker** on “An experiment in swarm robotics: the swarm-bot” at the “2nd International Workshop on Swarm Robotics”, Rome, Italy, September 30, 2006.

**Invited plenary speaker** on “Swarms of self-assembling robots” at the “IEEE World Congress on Computational Intelligence”, Vancouver, Canada, July 18, 2006.

**Invited plenary speaker** on “The ant colony optimization metaheuristic” at the “3rd International Conference on Pedestrian and Evacuation Dynamics”, Vienna, Austria, September 30, 2005.

**Invited plenary speaker** on “The swarm-bot approach to swarm robotics” at the “The 3rd International Symposium on Autonomous Minirobots for Research and Edutainment (AMiRE 2005)”, Awara-Spa, Fukui, Japan, September 21, 2005.

**Invited plenary speaker** on “Swarm-bots: Self-assembling swarms of robots” at the “ECAL 2005 – Eighth European Conference on Artificial Life, Canterbury, UK, Sep 7, 2005.

**Invited plenary speaker** on “Swarm-bot: An experiment in swarm robotics” at the “IEEE Swarm Intelligence Symposium”, Pasadena, California, June 8, 2005.

**Invited speaker** on “Swarm intelligence: State-of-the-art and future challenges” at the “Future and Emerging Technologies Unit of the European Commission”, Brussels, Belgium, May 23, 2005.

**Invited speaker** on “A gentle introduction to the ant colony optimization metaheuristic” at the “5th Regensburg Symposium on Evolutionary Biology “Ant algorithms”, Regensburg, Germany, May 2, 2005.

**Invited speech** on “Swarm-bot: A novel type of self-assembling robot” at the “Workshop on Cooperative Robotics - International Conference on Robotics and Automation”, Barcelona, Spain, April 22, 2005

**Invited speaker** on “Artificial ants solve network optimization problems” within the series of conferences titled “Evolution of Complex Networks” at Barcelona’s Museum of Sciences, Feb 23, 2005, Barcelona, Spain.

**Invited speaker** at the “Optimization 2004” conference, Lisbon, Portugal, Jul 28, 2004.

**Invited speaker** at the “Research cluster on complex systems”, Imperial College London, UK, Apr 1, 2004.

**Invited speaker** at the “Open Systems Conference”, Rotterdam, The Netherlands, Nov 27, 2003.

**Invited speaker** at the “Research cluster on swarm intelligence”, Sheffield, UK, Nov 11, 2003.

**Invited speaker** at the “Second International Conference on Evolutionary Multi-Criterion Optimization (EMO 2003)” and “First IFAC International Conference on Intelligent Control and Signal Processing (ICONS 2003)”, Faro, Portugal, Apr 10, 2003.

**Invited speaker** at the “Third International Workshop on Engineering Societies in the Agents World” at Universidad Rey Juan Carlos, Madrid, Spain, Sep 16–17, 2002.

**Invited speaker** at the two-day seminar on “Collective Intelligence” at University of Fribourg, Switzerland, Feb 25–26, 2002.

**Invited speaker** at the FNRS workshop on “Métaheuristiques et traitement de problèmes combinatoires” at Université Libre de Bruxelles, Belgium, Feb 7, 2002.

**Invited speaker** (by the Portuguese Minister for Science and Technology) on “Social intelligence: from natural to artificial systems” within the series of conferences titled “Positions of knowledge: some critical thresholds,” Jan 25, 2002, Lisbon, Portugal.

**Invited speaker** at the “6th European Conference on Artificial Life,” Prague, Czech Republic, Sep 10-14, 2001.

**Invited speaker** at the “Tenth Turkish Symposium on Artificial Intelligence and Neural Networks,” Famagusta, North Cyprus, Jun 21-22, 2001.

**Invited speaker** at “ETAPS 2001 – MMAABS: Workshop on Models and Methods of Analysis for Agent Based Systems,” Genova, Italy, Apr 2-6, 2001.

**Invited speaker** on “Ant algorithms: Multi-agent systems inspired by the observation of ant colony behavior” at the “Fourth International Conference on Autonomous Agents (Agents 2000),” Barcelona, Spain, June 3-7, 2000.

**Invited speaker** at the “7èmes Journées Francophones d'Intelligence Artificielle et Systèmes Multi-Agents (JFIADSMA'99),” Saint-Gilles, Ile de la Réunion, France, Nov 8-10, 1999.

**Invited speaker** at the “First USA-Italy Conference on Applied Neural and Cognitive Sciences,” Boston, MA, Oct 4, 1999.

**Invited speaker** at the “EUROGEN99,” Jyväskylä, Finland, Jun 2, 1999.

**Invited key-note speaker** at “Real World Intelligence joint WG meeting”, AIST Hall, Tsukuba, Japan, Mar 4, 1998.

**Invited plenary talk** at “IEE Colloquium on Self-Learning Robots II: Bio-Robotics”, Savoy Place, London, UK, Feb 12, 1998.

**Invited talk** at “NSF Workshop on Reinforcement Learning”, Hilltop House, Harper's Ferry, MD, Apr 12–14, 1996.

**Invited plenary talk** at “IEE Colloquium on Self-learning robots”, Savoy Place, London, UK, Feb 12, 1996.

**Invited plenary talk** at “BENELEARN-95, 5th Belgian-Dutch Conference on Machine Learning,” Université Libre de Bruxelles, Belgium, Sep 15, 1995.

**Invited talk** at “SFI Working Group on Learning and Adaptation in Robots and Situated Agents”, Santa Fe Institute, NM, May 9–13, 1993.

## **Fellowships**

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**Visiting professor** three-months fellowship given by the CSIC, Spanish Scientific Research Council to visit the Institut d'Investigacio en Intel.ligencia Artificial, Bellaterra, Catalonia, Spain. May 2002 - Jul 2002.

**Post-doc** fellowship given by the Swiss National Research Fund, 1996–1998 (24 months), at IDSIA, Istituto Dalle Molle di Studi sull'Intelligenza Artificiale, Lugano, Switzerland (stopped after 5 months to accept a permanent position offered by the Belgian FNRS).

**Post-doc** fellowship given by the European Community within the program “Human, Capital and Mobility,” Aug 1994 - Jul 1996 (24 months) at IRIDIA, Université Libre de Bruxelles, Bruxelles, Belgium.

**Senior visiting scientist** fellowship given by the University of Berkeley and CNR, March–April 1996 (two months), at the International Computer Science Institute, Berkeley, California.

**Visiting scientist** fellowship given by the University of Nice, April 1995 (one month), at the I3S laboratory, CNRS, Sophia Antipolis, France.

**Post-doc** fellowship given by “NATO-CNR,” Jul 1993 - May 1994 (11 months) at IRIDIA, Université Libre de Bruxelles, Bruxelles, Belgium.

**Post-doc** fellowship given by the University of Berkeley and CNR, April 1992 - March 1993 (12 months), at the International Computer Science Institute, Berkeley, California.

**Three years** fellowship by the Italian Government to join the doctoral program in Systems and Information Electronic Engineering at Politecnico di Milano, Italy. Nov 1988 - Oct 1991.

## ORGANIZATION ACTIVITIES

### Editorial activities

**Editor-in-Chief** for the journal “Swarm Intelligence” (since 2007, Vol.1, No.1).

**Associate editor** for the journals:

- *ACM Trans. on Autonomous and Adaptive Systems* (since 2006, Vol.1, No.1).
- *AI Communications* (since 2000, Vol.13, No.3 – IF: 0.585).
- *Cognitive Systems Research* (since 1999, Vol.1, No.1 – IF: 1.111).
- *IEEE Trans. on Systems, Man, and Cybernetics* (since 1993, Vol.23, No.3 – IF: 1.353).
- *IEEE Transactions on Evolutionary Computation* (since 1997, Vol.1, No.1 – IF: 2.426).
- *IEEE Transactions on Autonomous Mental Development* (since 2009, Vol.1, No.1).
- *International Journal of Bio-Inspired Computation* (since 2009, Vol.1, No.1).
- *Journal of Heuristics* (since 1999, Vol.5 – IF: 0.644).
- *Mathware and Soft Computing* (since May 2001).

**Member of the Editorial Board** of the journals:

- *Adaptive Behavior* (since 1996, Vol. 4, No.1 – IF: 1.024).
- *Artificial Life* (since 2001, Vol.7, No.1 – IF: 1.644).
- *Evolutionary Computation* (since 1993, Vol.1, No.1 – IF: 1.575).
- *Information Sciences* (from 2004, Vol.159, No.1 to 2008, Vol.178, No.11 – IF: 1.575).
- *Int. Jour. of Innovative Computing & Applications* (since 2007, Vol.1, No.1).
- *Int. Jour. of Intelligent Computing & Cybernetics* (since 2008, Vol.1, No.1).
- *Genetic Programming and Evolvable Machines* (since 1999, Vol.1, No.1).
- *Paladyn. Journal of Behavioral Robotics* (since 2010, Vol.1, No.1).

**Member of the Advisory Board:**

- Handbook of Natural Computing, Springer, 2010.

**Guest editor** of the special issues on:

- Swarm Robotics, *Autonomous Robots* (2004, Vol.17, No.2–3).
- Ant Colony Optimization, *IEEE Transactions on Evolutionary Computation* (August 2002, Vol.6, No.4).
- Ant Algorithms, *Future Generation Computer Systems* (June 2000, Vol. 16, No. 8, pp.851–956).
- Learning Autonomous Robots, *IEEE Transactions on Systems, Man, and Cybernetics–Part B* (June 1996, Vol.26, No.3).

**Member of the Special Review Panel** of the special issues on:

- Biomimetic Robotics, *Robotics and Autonomous Systems*, Vol. 30, No. 1–2, 2000.
- Learning Autonomous Robots, *Autonomous Robots*, Vol.5, No. 3, and *Machine Learning*, Vol. 31, Nos. 1–3, 1998.
- Robot Learning: The New Wave, *Robotics and Autonomous Systems*, Vol. 22, Nos. 3–4, 1997.

**Referee** for the following international journals: 4OR, ACM Computing Surveys, Adaptive Behavior, Advances in Water Resources, Annals of Mathematics and Artificial Intelligence, Annals of Operations Research, Applied Artificial Intelligence, Autonomous Agents and Multi-Agent Systems, Australian & New Zealand Industrial and Applied Mathematics Journal, Autonomous Robots, BMC Bioinformatics, Central European Journal of Operations Research, Circuits, Systems and Signal Processing, Computational Optimization and Applications, Computer

Surveys, Computers & Geosciences, Computers & Industrial Engineering, Computers & Operations Research, Discrete and Applied Mathematics, Electronics Letters, Environmental Monitoring and Assessment, European Journal of Operational Research, Evolutionary Computation, Future Generation Computer Systems, IEE Electronic Letters, IEE Proceedings in Computers and Digital Techniques, IEEE Control Systems, IEEE Robotics and Automation Magazine, IEEE Transactions on Automatic Control, IEEE Transactions on Circuits and Systems I, IEEE Transactions on Control Systems Technology, IEEE Transactions on Instrumentation and Measurement, IEEE Transactions on Knowledge and Data Engineering, IEEE Transactions on Mecathronics, IEEE Transactions on Neural Networks, IEEE Transactions on Systems, Man, and Cybernetics, IEEE Transactions on Wireless Communications, IIE Transactions, IIE Transactions on Design and Manufacturing, Information Processing Letters, Interface , International Journal of Approximate Reasoning, International Journal of Control, Automation, and Systems, International Journal of Geographic Information Systems, International Journal of Microelectronic Systems Integration, International Journal for Numerical Methods in Engineering, International Journal of Power and Energy Systems, International Journal of Production Economics, International Journal of Systems Integration, International Transactions in Operational Research, Journal of Artificial Intelligence Research, Journal of Computer Science and Technology, Journal of Mathematical Modelling and Algorithms, Journal of the Australian Mathematical Society, Machine Learning, Methodology and Computing in Applied Probability, Microprocessing and Microprogramming, Nature, Neural Computing & Applications, Omega, Operations Research, ORSA Journal on Computing, Pattern Analysis and Applications Journal, Pattern Recognition Letters, Physics Letters A, Physics of Life Reviews, Robotics and Autonomous Systems, The Computer Journal, Water Resources Research.

**Referee** for the following major international conferences: International Joint Conference on Artificial Intelligence 1995, 1997, 2001.

**Technical reviewer** of the book Evolutionary Computation, by D. Fogel, 1995, IEEE Press.



## **Conference organization**

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**Honorary Chair** for the conference:

- IEEE Swarm – Second IEEE International Symposium on Swarm Intelligence, Pasadena, California (June 8–10, 2005).

**General Chair** for the conferences:

- ANTS2010 – Seventh International Conference on Swarm Intelligence, Université Libre de Bruxelles, Brussels, Belgium (Sep 8–10, 2010).
- ANTS2008 – Sixth International Conference on Ant Colony Optimization and Swarm Intelligence, Université Libre de Bruxelles, Brussels, Belgium (Sep 22–24, 2008).
- IEEE SIS07 – IEEE Swarm Intelligence Symposium, Hilton Hawaiian Village, Honolulu, Hawaii (April 1–5, 2007).
- ANTS2006 – Fifth International Workshop on Ant Colony Optimization and Swarm Intelligence, Université Libre de Bruxelles, Brussels, Belgium (Sep 4–7, 2006).
- ANTS2004 – Fourth International Workshop on Ant Colony Optimization and Swarm Intelligence, Université Libre de Bruxelles, Brussels, Belgium (Sep 5–8, 2004).
- ANTS2002 – From Ant Colonies to Artificial Ants: Third International Workshop on Ant Algorithms, Université Libre de Bruxelles, Brussels, Belgium (Sep 11–14, 2002).
- ANTS2000 – From Ant Colonies to Artificial Ants: Second International Workshop on Ant Algorithms, Université Libre de Bruxelles, Brussels, Belgium (Sep 7–9, 2000).
- Fourth European Workshop on Reinforcement Learning (EWRL-4), Lugano, Switzerland (Oct 29–30, 1999).
- ANTS'98 – From Ant Colonies to Artificial Ants: First International Workshop on Ant Colony Optimization, Université Libre de Bruxelles, Brussels, Belgium (Oct 15–16, 1998).
- Third European Workshop on Reinforcement Learning (EWRL-3), Rennes, France (Oct 13–14, 1997).
- Second European Workshop on Reinforcement Learning (EWRL-2), Milano, Italy (Sep 18–19, 1995).
- First European Workshop on Reinforcement Learning (EWRL-1), Brussels, Belgium (Sep 27–28, 1994).

**Advisory Chair** for the conference:

- IEEE CEC 2011 – 2011 IEEE Congress on Evolutionary Computation – The Big EC, New Orleans (June 5–8, 2011).

**Technical program chair** for IEEE CEC-2005 – IEEE International Congress on Evolutionary Computation, Edinburgh, UK (Sep 2–5, 2005).

**Special session chair** for the **Ant Colony Optimization** track Conference “MIC-2001 – 4th Metaheuristics International Conference,” Porto, Portugal, (Jul 16-20, 2001).

**Plenary talk chair** for the CEC'2000 – IEEE International Congress on Evolutionary Computation, La Jolla, CA (Jul 16-19, 2000).

**Special track chair** for the **Ant Colony Optimization** track at the Conference “IEEE 1999 International Congress on Evolutionary Computation”, Washington D.C. (Jul 6-9, 1999).

**Special programme chair** for the **Evolutionary Robotics** track at the Conference “Third Annual Genetic Programming Conference - GP 98,” University of Wisconsin - Madison, WI (Jul 22–25, 1998).

**Session organizer** for the “INFORMS Meeting–Session on Ant Colony Optimization,” Tel Aviv, Israel (Jun 28–Jul 1, 1998).

**Organizer** of the “First International Contest on Evolutionary Optimization (ICEO-1),” Nagoya University, Japan (May 20-22, 1996).

**European liaison chair** for the “1995 IEEE Conference on Evolutionary Computation,” Perth, Western Australia (Nov 29 – Dec 1, 1995).

### **Conference program committees**

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**Member** of the Program Committee of 187 international conferences in the last ten years (for a complete list, see <http://iridia.ulb.ac.be/~mdorigo/HomePageDorigo/programcommittees.php>).

**Senior member** of the Program Committee for the following conference:

- International Joint Conference on Autonomous Agents and Multi-Agent Systems (AAMAS 2002), Palazzo Re Enzo, Bologna, Italy (July 15-19, 2002).
- 2001 Genetic and Evolutionary Computation Conference (GECCO-2001), San Francisco, CA, (Jul 7-11, 2001).
- 2000 Genetic and Evolutionary Computation Conference (GECCO-2000), Las Vegas, USA (8-12 Jul, 2000).
- Fourth International Conference on Autonomous Agents (Agents 2000), Barcelona, Spain (Jun 3-7, 2000).
- 1999 Genetic and Evolutionary Computation Conference (GECCO-99), Orlando, FL (Jul 14-17, 1999).

### **Society memberships**

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Member of IEEE (Institute of Electrical and Electronics Engineers) since 1992 (**Fellow** since 2006).

Member of ECCAI (European Coordinating Committee for Artificial Intelligence) since 1988 (**Fellow** since 2007).

Founding member of AI\*IA (Associazione Italiana per l'Intelligenza Artificiale) since 1988.

Member of AAI (American Association for Artificial Intelligence) since 1999.

Founding member of ISGEC (International Society for Genetic and Evolutionary Computation – now SIGEVO) since 1999.

Member of ACM (Association for Computing Machinery) since 2000.

Member of AAAS (American Association for the Advancement of Science Sciences) since 2001.

Member of IAS (Intelligent Autonomous Systems) society since 2001.

Member of INFORMS (Institute for Operations Research and the Management Sciences) since 1998.

### **Projects evaluations**

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**Referee** for the IST European Community Programme (2007-2013).

**Referee** for the IST European Community Programme “FET – Future and Emerging Technologies” (1999-2007).

**Referee** for the ESPRIT European Community Programme “LTR – Long Term Research” (1997-1998).

**Referee** for the TMR European Community Programme “Training and Mobility of Researchers” (1997-1998).

**Member** of the Qualification Commission “Information and Communication Systems” of the Belgian State (1998).

## LANGUAGES

*Fluent* Italian, English, French

*Basic* German

## WORK ADDRESS

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e-mail: [mdorigo@ulb.ac.be](mailto:mdorigo@ulb.ac.be)  
WWW: <http://iridia.ulb.ac.be/~mdorigo/>

## PERSONAL DATA

AGE: Born in Milan, Italy, on August 26, 1961  
FAMILY: Married, two children  
NATIONALITY: Italian

## PUBLICATIONS

### International books

- IB.01 Dorigo M. & M. Colombetti (1998). *Robot Shaping: An Experiment in Behavior Engineering*. Cambridge, MA: MIT Press/Bradford Books.
- IB.02 Bonabeau E., M. Dorigo & G. Theraulaz (1999). *Swarm Intelligence: From Natural to Artificial Systems*. New York, NY: Oxford University Press.
- IB.03 Dorigo M. & T. Stützle (2004). *Ant Colony Optimization*. Cambridge, MA: MIT Press/Bradford Books.

### Edited international books, proceedings and journal special issues

- EB.01 Dorigo M. (1996). Special Issue on Learning Autonomous Robots, *IEEE Transactions on Systems, Man, and Cybernetics–Part B*, 26 (3): 361–506.
- EB.02 Koza J. R., D. Kalyanmoy, M. Dorigo, D. B. Fogel, M. Garzon, H. Iba, & R. L. Riolo, Editors (1997). *Genetic Programming 1997: Proceedings of the Second Annual Conference*, July 13-16, 1997, Stanford University, San Francisco, CA: Morgan Kaufmann, pp. 542.
- EB.03 Koza J. R., W. Banzhaf, K. Chellapilla, D. Kalyanmoy, M. Dorigo, D. B. Fogel, M. H. Garzon, D. E. Goldberg, H. Iba, & R. L. Riolo, Editors (1998). *Genetic Programming 1998: Proceedings of the Third Annual Conference*, July 22-25, 1998, University of Wisconsin, Madison, WI: Morgan Kaufmann, pp. 895.
- EB.04 Corne D., M. Dorigo & F. Glover, Editors (1999). *New Ideas in Optimisation*. London, UK: McGraw-Hill, pp. 494.
- EB.05 Dorigo M., T. Stützle & G. Di Caro, Editors (2000). Special Issue on Ant Algorithms, *Future Generation Computer Systems*, 16 (8): 851–956.
- EB.06 Dorigo M., M. Middendorf & T. Stützle, Editors (2000). Abstract proceedings of ANTS 2000 – From Real to Artificial Ants: Second International Workshop on ant algorithms, IRIDIA, ULB, pp. 166.
- EB.07 Dorigo M., L. M. Gambardella, M. Middendorf & T. Stützle (2002). Special Section on Ant Colony Optimization, *IEEE Transactions on Evolutionary Computation*, 6 (4): 317–365.
- EB.08 Dorigo M., G. Di Caro & M. Sampels, Editors (2002). *Ant Algorithms, Proceedings of Ants2002 – From Real to Artificial Ants: Third International Workshop on Ant Algorithms*, LNCS 2463, Springer-Verlag, Berlin, Germany, pp. 310.
- EB.09 Dorigo M. & E. Sahin, Editors (2004). Special Issue on Swarm Robotics. *Autonomous Robots*, 17 (2–3): 111–246.
- EB.10 Dorigo M., M. Birattari, C. Blum, L. M. Gambardella, F. Mondada & T. Stützle, Editors (2004). Proceedings of *Ant Colony Optimization and Swarm Intelligence – Fourth International Workshop – ANTS 2004*, LNCS 3172, Springer-Verlag, Berlin, Germany, pp. 434.
- EB.11 Dorigo M., L. M. Gambardella, M. Birattari, A. Martinoli, R. Poli & T. Stützle, Editors (2006). Proceedings of *Ant Colony Optimization and Swarm Intelligence – Fifth International Workshop – ANTS 2006*, LNCS 4150, Springer-Verlag, Berlin, Germany, pp. 526.
- EB.12 Dorigo M., M. Birattari, C. Blum, M. Clerc, T. Stützle & A. Winfield, Editors (2008). Proceedings of *Ant Colony Optimization and Swarm Intelligence – Sixth International Conference – ANTS 2008*, LNCS 5217, Springer-Verlag, Berlin, Germany, pp. 420.

### International journals

- IJ.01 Dorigo M. (1992). Using Transputers to Increase Speed and Flexibility of Genetics-based Machine Learning Systems. *Microprocessing and Microprogramming (now Journal of Systems Architecture)*, 34: 147–152, North Holland.

- IJ.02 Dorigo M. & U.Schnepf (1993). Genetics-Based Machine Learning and Behavior-Based Robotics: A New Synthesis. *IEEE Transactions on Systems, Man, and Cybernetics*, 23 (1): 141–154.
- IJ.03 Bertoni A. & M. Dorigo (1993). Implicit Parallelism in Genetic Algorithms. *Artificial Intelligence*, 61 (2): 307–314.
- IJ.04 Dorigo M. (1993). Genetic and Non-Genetic Operators in Alecsys. *Evolutionary Computation*, 1 (2): 151–164, MIT Press.
- IJ.05 Dorigo M. & M. Colombetti (1994). Robot Shaping: Developing Autonomous Agents through Learning. *Artificial Intelligence*, 71 (2): 321–370.
- IJ.06 Colombetti M. & M. Dorigo (1994). Training Agents to Perform Sequential Behavior. *Adaptive Behavior*, MIT Press, 2 (3): 247–275.
- IJ.07 Maniezzo V., M. Dorigo & A. Colomi (1995). Algodesk: An Experimental Comparison of Eighth Evolutionary Heuristics Applied to the Quadratic Assignment Problem. *European Journal of Operational Research*, 81: 188–204.
- IJ.08 Dorigo M. (1995). ALECSYS and the AutoMouse: Learning to Control a Real Robot by Distributed Classifier Systems. *Machine Learning*, 19 (3): 209–240.
- IJ.09 Patel M.J., M. Colombetti & M. Dorigo (1995). Evolutionary Learning for Intelligent Automation: A Case Study. *Intelligent Automation and Soft Computing*, 1(1): 29–42.
- IJ.10 Dorigo M., V. Maniezzo & A. Colomi (1996). Ant System: Optimization by a Colony of Cooperating Agents. *IEEE Transactions on Systems, Man, and Cybernetics-Part B*, 26 (1): 29–41. (Also available as: *Tech. Rep. No. 91-016*, Politecnico di Milano, Italy.)
- IJ.11 Colombetti M., M.Dorigo & G.Borghi (1996). Behavior Analysis and Training: A Methodology for Behavior Engineering. *IEEE Transactions on Systems, Man, and Cybernetics-Part B*, 26 (3): 365–380.
- IJ.12 Dorigo M. (1996). Editorial Introduction to the Special Issue on Learning Autonomous Robots. (Editorial) *IEEE Transactions on Systems, Man, and Cybernetics-Part B*, 26 (3): 361–364.
- IJ.13 Colomi A., M. Dorigo, F. Maffioli, V. Maniezzo, G. Righini & M. Trubian (1996). Heuristics from Nature for Hard Combinatorial Problems. *International Transactions in Operational Research*, 3 (1): 1–21.
- IJ.14 Caironi P.V.C. & M. Dorigo (1997). Training and Delayed Reinforcements in Q-learning Agents. *International Journal of Intelligent Systems*, 12 (10): 695–724.
- IJ.15 Dorigo M. & L.M. Gambardella (1997). Ant Colonies for the Traveling Salesman Problem. *BioSystems*, 43: 73–81.
- IJ.16 Dorigo M. & L.M. Gambardella (1997). Ant Colony System: A Cooperative Learning Approach to the Traveling Salesman Problem. *IEEE Transactions on Evolutionary Computation*, 1 (1): 53–66.
- IJ.17 Dorigo M. & M. Colombetti (1997). Précis of Robot Shaping: An Experiment in Behavior Engineering. MIT Press/Bradford Books 1997. In Special issue on Complete Agent Learning in Complex Environments, M.J. Mataric (Ed.), *Adaptive Behavior*, 5 (3–4): 391–405.
- IJ.18 Dorigo M. & M. Colombetti (1997). Reply to Dario Floreano’s “Engineering Adaptive Behavior”. In Special issue on Complete Agent Learning in Complex Environments, M.J. Mataric (Ed.), *Adaptive Behavior*, 5 (3–4): 417–420.
- IJ.19 Colomi A., M. Dorigo & V. Maniezzo (1998). Metaheuristics for High-School Timetabling. *Computational Optimization and Applications*, 9 (3): 275–298.
- IJ.20 Di Caro G. & Dorigo M. (1998). AntNet: Distributed Stigmergetic Control for Communications Networks. *Journal of Artificial Intelligence Research (JAIR)*, 9: 317–365. (Also available as: *Tech. Rep. IRIDIA/98-01*, Université Libre de Bruxelles, Belgium.)
- IJ.21 Urzelai J. D. Floreano, M. Dorigo & M. Colombetti (1998). Incremental Robot Shaping. *Connection Science*, 10 (3–4): 341–360.

- IJ.22 Gambardella L. M., È. D. Taillard & M. Dorigo (1999). Ant Colonies for the Quadratic Assignment Problem. *Journal of the Operational Research Society*, 50 (2): 167–176. (Also available as: *Tech. Rep. IDSIA/4-97*, IDSIA, Lugano, Switzerland.)
- IJ.23 Dorigo M., G. Di Caro & L. M. Gambardella (1999). Ant Algorithms for Discrete Optimization. *Artificial Life*, 5 (2): 137–172. (Also available as: *Tech. Rep. IRIDIA/98-10*, Université Libre de Bruxelles, Belgium.)
- IJ.24 Dorigo M., E. Bonabeau & G. Theraulaz (2000). Ant Algorithms and Stigmergy. *Future Generation Computer Systems*, 16 (8): 851–871.
- IJ.25 Dorigo M., G. Di Caro & T. Stützle (2000). Guest Editorial – Ant Algorithms. *Future Generation Computer Systems*, 16 (8): v–vii.
- IJ.26 Gambardella L. M. & M. Dorigo (2000). Ant Colony System Hybridized with a New Local Search for the Sequential Ordering Problem. *INFORMS Journal on Computing*, 12 (3): 237–255.
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