



## Curriculum Vitæ of Mauro Birattari

as of October 2010

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### HIGHLIGHTS

Mauro Birattari is a research associate of the *Fonds de la Recherche Scientifique - FNRS*, which is the fund for scientific research of Belgium's French Community.

He is the author of the book "Tuning Metaheuristics: A machine learning perspective," published in 2009 by Springer.

He co-authored more than 80 peer-reviewed scientific publications in the field of computational intelligence.

His works have been cited more than 400 times in publications monitored by ISI Web of Science and, according to Google Scholar, more than 1500 times in the scientific literature. His *h-index* is 21.

He is an associate editor for the journal "Swarm Intelligence" and an area editor for the journal "Computers & Industrial Engineering". He is member of the editorial board of 5 international journals: "Evolutionary Computation", the "International Journal of Intelligent Computing and Cybernetics", the "International Journal of Applied Metaheuristic Computing", the "Journal of Advanced Research in Evolutionary Algorithms", and the "Mediterranean Journal of Artificial Intelligence".

He served as a member of the organizing committee (program chair, track chair, publication chair, and local arrangement chair) for 9 international conferences, and as a member of the program committee for more than twenty-five international conferences in the last five years.

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### RESEARCH INTERESTS

Computational intelligence, swarm intelligence, ant colony optimization, and swarm robotics.

Metaheuristics and local search methods for combinatorial optimization. Application of statistical methods, design of experiments, and machine learning techniques in operations research, notably for assessing the performance of algorithms and for fine-tuning their parameters.

Epistemology and philosophical foundations of computational intelligence.

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### EDUCATION

Ph.D. in Applied Sciences. **Université Libre de Bruxelles**. Brussels, Belgium. December 2004. Dissertation title: *The Problem of Tuning Metaheuristics as Seen from a Machine Learning Perspective*. Supervisor: Prof. M. Dorigo.

Diplôme d'Etudes Approfondies en Sciences Appliquées. **Université Libre de Bruxelles**. Brussels, Belgium. June 2001. Dissertation title: *On the Formal Foundation of Ant Programming*. Supervisor: Prof. M. Dorigo.

Laurea di Dottore in Ingegneria Elettronica. **Politecnico di Milano**. Milan, Italy. July 1997. Dissertation title: *Modelli Locali per l'Apprendimento: dall'approccio neuro-fuzzy al lazy learning*. Supervisors: Prof. A. Bonarini and G. Bontempi.

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### RESEARCH EXPERIENCE

Research Associate of the fund for scientific research F.R.S.-FNRS of Belgium's French Community at **IRIDIA**, Institut de Recherces Interdisciplinaires et de Développements en Intelligence Artificielle, **Université Libre de Bruxelles**, Brussels, Belgium. Since October 2007.

Senior Researcher at **IRIDIA**, Institut de Recherces Interdisciplinaires et de Développements en Intelligence Artificielle, **Université Libre de Bruxelles**, Brussels, Belgium. Since

January 2005.

Researcher at **IRIDIA**, Institut de Recherces Interdisciplinaires et de Développements en Intelligence Artificielle, **Université Libre de Bruxelles**, Brussels, Belgium. From April 2002 to December 2004. Senior scientist in charge: Prof. M. Dorigo.

Researcher at **Intellektik**, Computer Science Department, **Darmstadt University of Technology**, Darmstadt, Germany. From April 2001 to March 2002. Senior scientist in charge: Prof. W. Bibel.

Researcher at **AASS**, Applied Autonomous Sensor Systems, Department of Technology, **Örebro University**, Örebro, Sweden. From October 2000 to March 2001. Senior scientist in charge: Prof. A. Saffiotti.

Researcher at **IRIDIA**, Institut de Recherces Interdisciplinaires et de Développements en Intelligence Artificielle, **Université Libre de Bruxelles**, Brussels, Belgium. From August 1997 to September 2000. Senior scientist in charge: Prof. H. Bersini.

Visiting Student at **IRIDIA**, Institut de Recherces Interdisciplinaires et de Développements en Intelligence Artificielle, **Université Libre de Bruxelles**, Brussels, Belgium. From October 1996 to July 1997. Senior scientist in charge: Prof. H. Bersini.

Visiting Student at **IDSIA**, **Istituto dalle Molle**, Lugano, Switzerland. From June 1996 to September 1996. Senior scientist in charge: Prof. L. M. Gambardella.

Master Student at **AI&R Project**, Dipartimento di Elettronica e Informazione, **Politecnico di Milano**, Milan, Italy. From April 1996 to July 1997. Senior scientist in charge: Prof. A. Bonarini.

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TEACHING,  
SUPERVISION,  
AND  
EXAMINATION  
ACTIVITIES

Lecturer: INFO-H-414 *Swarm Intelligence* (with Prof. Marco Dorigo). Faculté des sciences appliquées, **Université Libre de Bruxelles**, Brussels, Belgium. Since Academic Year 2008–2009.

Professor in charge: PROJ-H-402 *Projet d'informatique*. Faculté des sciences appliquées, **Université Libre de Bruxelles**, Brussels, Belgium. Since Academic Year 2009–2010.

Professor in charge: TRAN-H-201 *Projet Multidisciplinaire II*. Filière Informatique, Faculté des sciences appliquées, **Université Libre de Bruxelles**, Brussels, Belgium. Since Academic Year 2008–2009.

Co-supervisor or advisor of 16 Ph.D. theses currently in progress: Manuele Brambilla, Arne Brutschy, Alexandre Campo, Antal Decugnière, Jérémie Dubois-Lacoste, Stefan Eppe, Eliseo Ferrante, Renaud Lenne, Nithin Mathews, Marco Montes de Oca, Sabrina Moreira de Oliveira, Mohamed Saifullah bin Hussin, Rehan O'Grady, Carlo Pinciroli, Giovanni Pini, Zhi "Eric" Yuan, **Université Libre de Bruxelles**, Brussels, Belgium.

Member of the Ph.D. examination committee: Rehan O'Grady (2010). *Morphologically Responsive Self-Assembling Robots*. **Université Libre de Bruxelles**, Brussels, Belgium.

Member of the Ph.D. examination committee: Matteo Gagliolo (2010). *Online Dynamic Algorithm Portfolios for Solving Decision Problems*. **Università della Svizzera Italiana**, Lugano, Switzerland.

Member of the Ph.D. examination committee: Emmanuelle Vin (2010). *Genetic Algorithm Applied to Generalized Cell Formation Problems*. **Université Libre de Bruxelles**, Brussels, Belgium.

Ph.D. thesis co-supervisor and member of the Ph.D. examination committee: Prasanna Balaprakash (2010). *Estimation-based Metaheuristics for Stochastic Combinatorial Optimization: Case studies in stochastic routing problems*. **Université Libre de Bruxelles**, Brussels, Belgium.

Member of the Ph.D. examination committee: Olivier Caelen (2009). *Sélection Séquentielle en Environnement Aléatoire Appliquée à l'Apprentissage Supervisé*. **Université Libre de Bruxelles**, Brussels, Belgium.

Member of the Ph.D. examination committee: Christophe Philemotte (2009). *The Gestalt Heuristic: Dynamic and online meta-modeling as improvement method to the metaheuristic process*. **Université Libre de Bruxelles**, Brussels, Belgium.

Member of the Ph.D. examination committee: Christos Ampatzis (2008). *On the Evolution of Autonomous Time-based Decision-making and Communication in Collective Robotics*. **Université Libre de Bruxelles**, Brussels, Belgium.

President of the Ph.D. examination committee: Shervin Nouyan (2008) *Teamwork in a Swarm of Robots – An Experiment in Search and Retrieval*. **Université Libre de Bruxelles**, Brussels, Belgium.

Ph.D. thesis advisor and member of the Ph.D. examination committee: Anders Christensen (2008) *Fault Detection in Autonomous Robots: Endogenous Fault Detection Through Fault Injection and Learning – Exogenous Fault Detection Based on Firefly-inspired Synchronization*. **Université Libre de Bruxelles**, Brussels, Belgium.

Member of the Ph.D. examination committee: Krzysztof Socha (2008) *Ant Colony Optimization for Continuous and Mixed-variable Domains*. **Université Libre de Bruxelles**, Brussels, Belgium.

Ph.D. thesis advisor: Jodelson A. Sabino (2008) *Otimização com Colônia de Formigas Aplicada à Programação de Operações de Locomotivas de Manobras*. **Pontifícia Universidade Católica do Rio de Janeiro**, Rio de Janeiro, Brazil.

Member of the Ph.D. examination committee: Roderich Groß (2007). *Self-assembling Robots*. **Université Libre de Bruxelles**, Brussels, Belgium.

Ph.D. thesis co-supervisor: Paola Pellegrini (2007). *ACO: Parameters, Exploration and Quality of Solutions*. **Università Ca' Foscari**, Venice, Italy.

Member of the Ph.D. examination committee: Leonora Bianchi (2006). *Ant Colony Optimization and Local Search for the Probabilistic Traveling Salesman Problem: A Case Study in Stochastic Combinatorial Optimization*. **Université Libre de Bruxelles**, Brussels, Belgium.

MAS<sup>1</sup> thesis co-supervisor: Arne Brutschy (2009) *Task Allocation in Swarm Robotics: Towards a Method for Self-Organized Allocation to Complex Tasks*. **Université Libre de Bruxelles**, Brussels, Belgium.

MAS thesis co-supervisor: Giovanni Pini (2009) *Towards Collective Robotics in a 3D Space: Simulation with Hand-bot Robots*. **Université Libre de Bruxelles**, Brussels, Belgium.

MAS thesis co-supervisor: Eliseo Ferrante (2009) *A Control Architecture for a Heterogeneous Swarm of Robots: The Design of a Modular Behavior-based Architecture*. **Université Libre de Bruxelles**, Brussels, Belgium.

DEA thesis co-supervisor: Javier Martinez Gonzales (2008) *Simulation of Intelligent Handbot Controllers: The Implementation of a Novel 3D Simulation Platform*. **Université Libre de Bruxelles**, Brussels, Belgium.

DEA thesis co-supervisor: Carlo Pinciroli (2007). *Object Retrieval by a Swarm of Ground Based Robots Driven by Aerial Robots: The Design of a Multi-engine and Multi-robot Three-dimensional Physics Simulator*. **Université Libre de Bruxelles**, Brussels, Belgium.

DEA thesis co-supervisor: Prasanna Balaprakash (2005). *Ant Colony Optimization Under Uncertainty: Sampling and Racing Techniques for the Probabilistic Salesman Problems*. **Université Libre de Bruxelles**, Brussels, Belgium.

DEA thesis co-supervisor: Max Manfrin (2004). *Ant Colony Optimization for the Vehicle Routing Problem*. **Université Libre de Bruxelles**, Brussels, Belgium.

Supervisor or co-supervisor of two Master theses currently in progress: Laurent Compère and Nicolas Janssens, **Université Libre de Bruxelles**, Brussels, Belgium.

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<sup>1</sup>MAS = Master of Advanced Studies (former DEA).

Master thesis co-supervisor: Mattia Manfroni (2010). *Towards Boolean Network Design for Robotics Applications*. **Università di Bologna**, Bologna, Italy.

Master thesis supervisor: Nadir Baiboun (2010). *Allocation des tâches en parallèles dans un essaim de robots: Étude et mise en œuvre sur la plateforme e-puck*. **ECAM, Haute École Léonard de Vinci**, Brussels, Belgium.

Master thesis supervisor: Nam-Luc Tran (2010). *Robotique en essaim et spécialisation: Etude sur la plateforme e-puck*. **Université Libre de Bruxelles**, Brussels, Belgium.

Master thesis co-supervisor: Marco Frison (2010). *Adaptive Task Partitioning in a Homogeneous Swarm of Robots*. **Università di Bologna**, Bologna, Italy.

Master thesis co-supervisor: Manuele Brambilla (2009). *Group Size Estimation in Swarm Robotics*. **Politecnico di Milano**, Milan, Italy.

Master thesis supervisor: Avit Sidis (2009). *Etude du Déplacement en Essaim de Robots e-Pucks*. **Université Libre de Bruxelles**, Brussels, Belgium.

Master thesis supervisor: Charlotte Philippe (2009). *Etude de la Conception d'un Système d'Assemblage pour Robots e-Pucks*. **Université Libre de Bruxelles**, Brussels, Belgium.

Master thesis supervisor: Antal Decugnière (2008). *Conception et Réalisation d'une Palette de Transport Intelligente pour le Projet d'Intelligence en Essaim Swarmanoid*. **Université Libre de Bruxelles**, Brussels, Belgium.

Master thesis supervisor: Benjamin Poulain (2008). *Développement d'un Stratégie de Transport Collectif dans le Cadre du Projet d'Intelligence en Essaim Swarmanoid: Specification d'une Palette Intelligente et de Son Environnement de Simulation*. **Université Libre de Bruxelles**, Brussels, Belgium.

Master thesis co-supervisor: Francesco Cuffaro (2008). *Catene di Robot nella Robotica a Sciame: Localizzazione, Comunicazione e Stima di Distanze Tramite l'Utilizzo di Sensori di Prossimità*. **Politecnico di Milano**, Milan, Italy.

Master thesis co-supervisor: Mouhcine Zekkri (2007). *Étude d'un Mécanisme de Measure Collective dans un Comportement Collectif Auto-organisé en Robotique en Essaim via une Tâche d'Agrégation avec les Robots E-puck*. **Université Libre de Bruxelles**, Brussels, Belgium.

Master thesis co-supervisor: Huynh Trung Truc (2007). *An Ant Colony Optimization Algorithm for Biobjective Permutation Flowshop Problems*. **Université Libre de Bruxelles**, Brussels, Belgium.

Master thesis co-supervisor: Antoine Dubois (2007). *Contrôle de la Taille de Groupe en Robotique en Essaim: Conception et Étude d'une Méthode Scalable et Robuste*. **Université Libre de Bruxelles**, Brussels, Belgium.

Master thesis co-supervisor: Olivier Colot (2007). *Recherche Basée sur un Modèle en Optimisation Continue*. **Université Libre de Bruxelles**, Brussels, Belgium.

Master thesis co-supervisor: Olivier Dédriche (2007). *La Prise de Décision au Sein d'un Groupe de Robots: Conception et Développement d'une Plateforme de Travail Libre et Gratuite pour les Robot E-puck à Destination de la Communauté Académique, et Étude d'un Comportement Collectif Auto-organisé via une Tâche d'Agrégation en Robotique en Essaim*. **Université Libre de Bruxelles**, Brussels, Belgium.

Master thesis co-supervisor: Laurent Bury (2007). *Conception et Implémentation en C++ d'un Simulateur pour les Robot E-puck et Réalisation de Tests de Validation pour la Cinématique de Base*. **Université Libre de Bruxelles**, Brussels, Belgium.

Master thesis co-supervisor: Magny Denis (2005). *Optimization Basée sur l'Algorithme Race*. **Université Libre de Bruxelles**, Brussels, Belgium.

Master thesis co-supervisor: Michela Lunghi (2005). *Il Metodo della Superficie di Risposta per la Configurazione di Metaeuristiche*. **Università degli Studi di Ferrara**, Ferrara,

Italy.

Master thesis co-supervisor: Denis Darquennes (2005). *Implementation and Application of Ant Colony Algorithms*, **Facultés Universitaires Notre Dame de la Paix**, Namur, Belgium.

Master thesis co-supervisor: Max Manfrin (2003). *Metaheuristiche per la Costruzione degli Orari dei Corsi Universitari*. **Università degli Studi di Firenze**, Florence, Italy. Teaching assistant at **Fachbereich Informatik, Technische Universität Darmstadt**, Darmstadt, Germany. Lecture on the configuration of metaheuristics through design of experiments, for the course *Lokale Suchverfahren und Metaheuristike* of Dr. T. Stützle. Academic Year 2001–2002.

Teaching assistant at **Institutionen för Teknik, Örebro Universitet**, Örebro, Sweden. *Labs on Machine Learning*, for the course on Neural Networks of Dr. T. Duckett. Academic Year 2000–2001.

Teaching assistant at **Ecole de Commerce Solvay, Faculté des Sciences Sociales, Politiques et Economiques, Université Libre de Bruxelles**, Brussels, Belgium. *Labs on Java and Object Oriented Programming*, for the course on computer science of Prof. H. Bersini. Academic Years 1997–1998 and 1998–1999.

Invited lecturer at **Faculté des Sciences Appliquées, Université Libre de Bruxelles**, Brussels, Belgium. *Seminars on supervised learning, neural networks, and lazy learning*, for the course on artificial intelligence of Prof. H. Bersini. Academic Year 1999–2000.

Invited lecturer at **Applied Autonomous Sensor Systems, Institutionen för Teknik, Örebro Universitet**, Örebro, Sweden. *Two lectures on lazy learning for doctoral students*. August 1999.

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EDITORIAL AND  
ORGANIZATIONAL  
ACTIVITIES

**Associate Editor** of *Swarm Intelligence*, since October 2006.

**Area Editor** of *Computers & Industrial Engineering*, since December 2007.

**Editorial Board Member** of the *International Journal of Applied Metaheuristic Computing*, since January 2009.

**Editorial Board Member** of the *Journal of Advanced Research in Evolutionary Algorithms*, since September 2008.

**Editorial Board Member** of the *International Journal of Intelligent Computing and Cybernetics*, since May 2007.

**Editorial Board Member** of *Evolutionary Computation*, from February 2007 to January 2011.

**Editorial Board Member** of the *Mediterranean Journal of Artificial Intelligence*, since November 2006.

**Organization Co-Chair** of *ANTS 2010 – Seventh International Conference on Swarm Intelligence*. Brussels, Belgium, September 8–10, 2010.

**Program Co-Chair** of *SLS 2009 – Engineering Stochastic Local Search Algorithms, Designing, Implementing and Analyzing Effective Heuristics*. Brussels, Belgium, September 3–5, 2009.

**Track Co-Chair** of *GECCO 2009 – Genetic and Evolutionary Computation Conference*, track on ant colony optimization and swarm intelligence. Montréal, Canada, July 8–12, 2009.

**Publication Chair** of *ANTS 2008 – Sixth International Conference on Ant Colony Optimization and Swarm Intelligence*. Brussels, Belgium, September 22–24, 2008.

**Program Co-Chair** of *SLS 2007 – Engineering Stochastic Local Search Algorithms, Designing, Implementing and Analyzing Effective Heuristics*. Brussels, Belgium, September 6–8, 2007.

**Track Co-Chair** of *GECCO 2007 – Genetic and Evolutionary Computation Conference*, track on ant colony optimization, swarm intelligence, and artificial immune systems. London, UK, July 7–11, 2007.

**Publication Chair** of *ANTS 2006 – Fifth International Workshop on Ant Colony Optimization and Swarm Intelligence*. Brussels, Belgium, September 4–7, 2006.

**Publication Chair** of *ANTS 2004 – Fourth International Workshop on Ant Colony Optimization and Swarm Intelligence*. Brussels, Belgium, September 5–8, 2004.

**Local Arrangement Chair** of *ANTS 2002 – From Ant Colonies to Artificial Ants: Third International Workshop on Ant Algorithms*. Brussels, Belgium, September 12–14, 2002.

**Program Committee Member** of *ICINCO 2011 – 8th International Conference on Informatics in Control, Automation and Robotics*. Noordwijkerhout, The Netherlands, July 28–31, 2011.

**Program Committee Member** of *MIC 2011 – Metaheuristics International Conference*. Udine, Italy, July 25–28, 2011.

**Program Committee Member** of *CSIE 2011 – 2nd World Congress on Computer Science and Information Engineering*. Changchun, China, June 17–19, 2011.

**Program Committee Member** of *AAMAS 2011 – International Joint Conference on Autonomous Agents and Multiagent Systems*. Taipei, Taiwan, May 2–6, 2011.

**Program Committee Member** of *SIS 2011 – IEEE Swarm Intelligence Symposium*. Paris, France, April 11–15, 2011.

**Program Committee Member** of *LION 5 – Learning and Intelligent Optimization*. Rome, Italy, January 17–21, 2011.

**Program Committee Member** of *GCIS 2010 – Global Congress on Intelligent Systems*. Wuhan, China, December 16–17, 2010.

**Program Committee Member** of *HM 2010 – Seventh International Workshop on Hybrid Metaheuristics*. Vienna, Austria, October 1–2, 2010.

**Program Committee Member** of *EMACS – Experimental Methods for the Assessment of Computational Systems*. Krakow, Poland, September 11, 2010.

**Program Committee Member** of *GECCO 2010 – Genetic and Evolutionary Computation Conference*. Portland, Oregon, July 7–11, 2010.

**Program Committee Member** of *ICINCO 2010 – 7th International Conference on Informatics in Control, Automation and Robotics*. Funchal, Madeira, Portugal, June 15–18, 2010.

**Program Committee Member** of *LION 4 – Learning and Intelligent Optimization*. Venice, Italy, January 18–22, 2010.

**Program Committee Member** of *ISDA 2009 – 9th International Conference on Intelligent Systems Design and Applications*. Pisa, Italy, November 30–December 2, 2009.

**Program Committee Member** of *HM 2009 – Sixth International Workshop on Hybrid Metaheuristics*. Udine, Italy, October 16–17, 2009.

**Program Committee Member** of *SLS-DS 2009 – Second Doctoral Symposium on Engineering Stochastic Local Search Algorithms*. Brussels, Belgium, September 4, 2009.

**Program Committee Member** of *CIE39 – International Conference on Computers & Industrial Engineering*. Troyes, France, July 6–8, 2009.

**Program Committee Member** of *ICIEA 2009 – The 4th IEEE Conference on Industrial Electronics and Applications*. Xi'an, China, May 25–27, 2009.

**Program Committee Member** of *GCIS 2009 – Global Congress on Intelligent Systems*. Xiamen, China, May 19–21, 2009.

**Program Committee Member** of *CEC 2009 – IEEE Congress on Evolutionary Computation*. Trondheim, Norway, May 18–21, 2009.

**Program Committee Member** of *SIS 2009 – IEEE Swarm Intelligence Symposium*. Nashville, TN, USA, March 30–April 2, 2009.

**Program Committee Member** of *LION 3 – Learning and Intelligent Optimization*. Trento, Italy, January 14–18, 2009.

**Program Committee Member** of *HM 2008 – Fifth International Workshop on Hybrid Metaheuristics*. Málaga, Spain, October 8–9, 2008.

**Program Committee Member** of *HIS 2008 – 8th International Conference on Hybrid Intelligent Systems*. Barcelona, Spain, September 10–12, 2008.

**Program Committee Member** of *WCCI 2008 – IEEE World Congress on Computational Intelligence*. Hong Kong, June 1–6, 2008.

**Program Committee Member** of *HM 2007 – Fourth International Workshop on Hybrid Metaheuristics*. Dortmund, Germany, October 8–9, 2007.

**Program Committee Member** of *SIS 2007 – IEEE Swarm Intelligence Symposium*. Honolulu, HI, USA, April 1–5, 2007.

**Program Committee Member** of *EMAA 2006 – Workshop on Empirical Methods for the Analysis of Algorithms*. Reykjavik, Iceland September 9, 2006.

**Program Committee Member** of *HM 2006 – Third International Workshop on Hybrid Metaheuristics*. Agaete, Spain, October 13–15, 2006.

**Program Committee Member** of *HM 2005 – Second International Workshop on Hybrid Metaheuristics*. Barcelona, Spain, August 29–30, 2005.

**Referee** for several international conferences and for a number of international journals including: *IEEE Transactions on Evolutionary Computation*, *IEEE Transactions on Systems, Man, and Cybernetics*, *Journal of Artificial Intelligence Research*, *Journal of Mathematical Modelling and Algorithms*, *Annals of Operations Research*, *Computers and Operations Research*, *Genetic Programming and Evolvable Machines*, *Constraints Journal*, *Connection Science*, *International Journal of Systems Science*, *Theoretical Computer Science*, *ACM Computing Surveys*, *Environmental Modelling and Software*, *Fuzzy Sets and Systems*, and *Autonomous Robots*.

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ACADEMIC AND PROFESSIONAL SOCIETIES Member of *ACM* since 2010.

Member of the *IEEE* and of the *IEEE Computational Intelligence Society* since 2005.

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ACADEMIC AND INDUSTRIAL RESEARCH PROJECTS **Swarm-Morph.** Research director of the project on robot morphogenesis funded by the *Fonds de la Recherche Fondamentale Collective (FRFC)* of the French Community of Belgium.

**Meta-X.** Main investigator of the *action de recherche concertée (ARC)* on metaheuristics for complex optimization problems funded by the French Community of Belgium.

**Evolving a Collective Consciousness for a Swarm of Pico-Satellites.** Member of the project funded by the *Ariadna* initiative of the European Space Agency.

**SWARMANOID.** Member of the scientific committee of the *future and emerging technologies* project funded by the European Commission.

**COMP<sup>2</sup>SYs.** Member of the training staff of the *early stage researchers training site* funded by the European Commission within the Marie Curie Actions program.

**ANTS.** Member of the *action de recherche concertée (ARC)* on the theoretical and experimental analysis of ant algorithms, funded by the French Community of Belgium.

**METAHEURISTICS.** Grant holder in the *training and research network* on metaheuristics funded by the European Commission.

**FAMIMO.** Contribution to the *Esprit* project funded by the European Commission, through the implementations of local techniques for nonlinear prediction and control.

**MARCH.** Participation in the *action de recherche concertée* (ARC) on pattern recognition funded by the the French Community of Belgium.

**Masterfood.** Collaboration with the research center of Masterfood for the prediction of market indices using lazy learning techniques.

**D'Ieteren.** Lazy learning techniques for predicting the annual amount of sales of a Belgian retailer, on the basis of historical data.

**FaFer Usinor.** Lazy learning for modeling the rolling mill process of the steel company FaFer in Charleroi, Belgium. FIRST Project funded by the Walloon Region, Belgium.

**Honeywell.** Collaboration on a data mining project with Honeywell Technology in Minneapolis, MN, USA, and in Prague, Czech Republic.

**Tractebel.** Feasibility study for the adoption of local lazy learning techniques for forecasting electrical loads. In collaboration with the Belgian electric power company.

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AWARDS,  
PRIZES, AND  
FELLOWSHIPS

2009 Outstanding Reviewer Award, “for work on International Journal of Intelligent Computing and Cybernetics, 2008”. Emerald Literati Network, June 2009.

Two papers [P29,P30] among the best 5 at ANTS 2006 – Fifth International Workshop on Ant Colony Optimization and Swarm Intelligence. Brussels, Belgium. September 2006.

Best Performing Algorithm [J10,T26] at the International Timetabling Competition organized by the *Metaheuristics Network* and sponsored by PATAT, the international series of conferences on the practice and theory of automated timetabling. Manno, Switzerland. March 2003.

Fellowship awarded by the *Metaheuristics Network*, a Research Training Network funded by the Improving Human Potential Programme of the Commission of the European Communities, grant HPRN-CT-1999-00106. Université Libre de Bruxelles, Brussels, Belgium. From April 2002 to August 2004.

Fellowship awarded by the *Metaheuristics Network*, a Research Training Network funded by the Improving Human Potential Programme of the Commission of the European Communities, grant HPRN-CT-1999-00106. Technische Universität Darmstadt, Darmstadt, Germany. From April 2001 to March 2002.

Best Paper Award [P11] at BNAIC’99: The Eleventh Belgium-Netherlands Conference on Artificial Intelligence. Maastricht, The Netherlands. November 1999.

Ranked Second [P10] at the Third Erudit Data Analysis Competition. Aachen, Germany. September 1999.

Ranked Second [P07] at the Time Series Competition of the International Workshop on Advanced Black-box Techniques for Nonlinear Modeling. Leuven, Belgium. July 1998.

Fellowship awarded by the Project Erasmus of the European Community. Université Libre de Bruxelles, Brussels, Belgium. From October 1996 to July 1997.

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CONTACT  
ADDRESS

**Mauro Birattari**

IRIDIA, CoDE, FSA – CP 194/6  
Université Libre de Bruxelles  
Av. F. D. Roosevelt 50  
1050 Brussels, Belgium

Phone: +32 2 650 3168  
Fax: +32 2 650 2715  
Web: <http://iridia.ulb.ac.be/~mbiro>  
Email: [mbiro@ulb.ac.be](mailto:mbiro@ulb.ac.be)

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PERSONAL  
DATA

Born in Milan, Italy, on June 24, 1969. Italian nationality. Languages: Italian, English, and French.

# Scientific Publications of Mauro Birattari

as of October 2010

ARTICLES IN  
JOURNALS

- [J25] J.A. Sabino, J.E. Leal, T. Stützle, and M. Birattari (2010). A multi-objective ant colony optimization method applied to switch engine scheduling in railroad yards. *Pesquisa Operacional*, accepted for publication.
- [J24] P. Balaprakash, M. Birattari, T. Stützle, and M. Dorigo (2010). Estimation-based metaheuristics for the probabilistic travelling salesman problem. *Computers & Operations Research*, vol. 37, no. 11, pp. 1939–1951.
- [J23] C. Piscopo and M. Birattari (2010). A critique of the constitutive role of truthlikeness in the similarity approach. *Erkenntnis*, vol. 72, no. 3, pp. 379–386.
- [J22] C. Twomey, T. Stützle, M. Dorigo, M. Manfrin, and M. Birattari (2010). An analysis of communication policies for homogeneous multi-colony ACO algorithms. *Information Sciences*, vol. 180, no. 12, pp. 2390–2404.
- [J21] P. Balaprakash, M. Birattari, T. Stützle, Z. Yuan, and M. Dorigo (2009). Estimation-based ant colony optimization and local search for the probabilistic traveling salesman problem. *Swarm Intelligence*, vol. 3, no. 3, pp. 223–242.
- [J20] M. A. Montes de Oca, T. Stützle, M. Birattari, and M. Dorigo (2009). Frankenstein’s PSO: A composite particle swarm optimization algorithm. *IEEE Transactions on Evolutionary Computation*, vol. 13, no. 5, pp. 1120–1132.
- [J19] P. Balaprakash, M. Birattari, T. Stützle, and M. Dorigo (2009). Adaptive sample size and importance sampling in estimation-based local search for the probabilistic traveling salesman problem. *European Journal of Operational Research*, vol. 199, pp. 98–110.
- [J18] M. Birattari, P. Balaprakash, T. Stützle, and M. Dorigo (2008). Estimation-based local search for stochastic combinatorial optimization using delta evaluations: A case study on the probabilistic traveling salesman problem. *INFORMS Journal on Computing*, vol. 20, no. 4, pp. 644–658.
- [J17] C. Piscopo and M. Birattari (2008). The metaphysical character of the criticisms raised against the use of probability for dealing with uncertainty in artificial intelligence. *Minds and Machines*, vol. 18, no. 2, pp. 273–288.
- [J16] A. L. Christensen, R. O’Grady, M. Birattari, and M. Dorigo (2008). Fault detection in autonomous robots based on fault injection and learning. *Autonomous Robots*, vol. 24, no. 1, pp. 49–67.
- [J15] M. Dorigo and M. Birattari (2007). Swarm intelligence. *Scholarpedia*, vol. 2, no. 9, p. 1462.
- [J14] M. Birattari, P. Pellegrini, and M. Dorigo (2007). On the invariance of ant colony optimization. *IEEE Transactions on Evolutionary Computation*, vol. 11, no. 3, pp. 732–742.
- [J13] M. Birattari and M. Dorigo (2007). How to assess and report the performance of a stochastic algorithm on a benchmark problem: Mean or best result on a number of runs? *Optimization Letters*, vol. 1, no. 3, pp. 309–311.
- [J12] M. Dorigo, M. Birattari, and T. Stützle (2006). Ant colony optimization: Artificial ants as a computational intelligence technique. *IEEE Computational Intelligence Magazine*, vol. 1, no. 4, pp. 28–39.
- [J11] M. Birattari, M. Zlochin, and M. Dorigo (2006). Towards a theory of practice in metaheuristics design: A machine learning perspective. *Theoretical Informatics and Applications*, vol. 40, no. 2, pp. 353–369.
- [J10] M. Chiarandini, M. Birattari, K. Socha, and O. Rossi-Doria (2006). An effective hybrid approach for the university course timetabling problem. *Journal of Scheduling*, vol. 9, no. 5, pp. 403–432.

- [J09] L. Bianchi, M. Birattari, M. Chiarandini, M. Manfrin, M. Mastrolilli, L. Paquete, O. Rossi-Doria, and T. Schiavinotto (2006). Hybrid metaheuristics for the vehicle routing problem with stochastic demands. *Journal of Mathematical Modelling and Algorithms*, vol. 5, no. 1, pp. 91–110.
- [J08] S. Nouyan, R. Ghizzioli, M. Birattari, and M. Dorigo (2005). An insect-based algorithm for the dynamic task allocation problem. *Künstliche Intelligenz*, no. 4/05, pp. 25–31.
- [J07] G. Bontempi and M. Birattari (2005). From linearization to lazy learning: A survey of divide-and-conquer techniques for nonlinear control, *International Journal of Computational Cognition*, vol. 3, no. 1, pp. 56–73.
- [J06] D. Villacci, G. Bontempi, A. Vaccaro, and M. Birattari (2005). The role of learning methods in the dynamic assessment of power components loading capability, *IEEE Transactions on Industrial Electronics*, vol. 52, no. 1, pp. 280–290.
- [J05] M. Zlochin, M. Birattari, N. Meuleau, and M. Dorigo (2004). Model-based search for combinatorial optimization: a critical survey, *Annals of Operations Research*, vol. 131, no. 1–4, pp. 375–395.
- [J04] E. Bertolissi, M. Birattari, G. Bontempi, A. Duchâteau, and H. Bersini (2002). Data-driven techniques for direct adaptive control: The lazy and the fuzzy approaches, *Fuzzy Sets and Systems*, vol. 128, no. 1, pp. 3–14.
- [J03] G. Bontempi, H. Bersini, and M. Birattari (2001). The local paradigm for modeling and control: From neuro-fuzzy to lazy learning, *Fuzzy Sets and Systems*, vol. 121, no. 1, pp. 59–72.
- [J02] G. Bontempi, M. Birattari, and H. Bersini (2000). A model selection approach for local learning, *AI Communications*, vol. 13, no. 1, pp. 41–47.
- [J01] G. Bontempi, M. Birattari, and H. Bersini (1999). Lazy learning for local modeling and control design, *International Journal of Control*, vol. 72, no. 7/8, pp. 643–658.

- 
- BOOKS, EDITED BOOKS, AND EDITED CONFERENCE PROCEEDINGS
- [B11] M. Dorigo, M. Birattari, G. A. Di Caro, R. Doursat, A. P. Engelbrecht, D. Floreano, L. M. Gambardella, R. Groß, E. Sahin, H. Sayama, and T. Stützle (Eds.) (2010). *Swarm Intelligence, 7th International Conference, ANTS 2010*, LNCS 6234, Springer, Berlin, Germany.
- [B10] T. Stützle, M. Birattari, and H. H. Hoos (Eds.) (2009). *Engineering Stochastic Local Search Algorithms: Designing, Implementing and Analyzing Effective Heuristics, 2nd International Workshop, SLS 2009*, LNCS 5752. Springer, Berlin, Germany.
- [B09] G.R. Raidl, E. Alba, J. Bacardit, H.-G. Beyer, M. Birattari, C. Blum, P.A.N. Bosman, C.B. Congdon, D. Corne, C. Cotta, M. Di Penta, B. Doerr, R. Drechsle, M. Ebner, J. Grahl, T. Jansen, J.D. Knowles, T. Lenaerts, M. Middendorf, J. F. Miller, M. O’Neill, R. Poli, G. Squillero, K.O. Stanley, T. Stützle, J. van Hemert (Eds.) (2009) *GECCO 2009: Genetic and Evolutionary Computation Conference*. ACM, New York, NY, USA.
- [B08] M. Birattari (2009). *Tuning Metaheuristics: A Machine Learning Perspective*. Springer, Berlin, Germany.
- [B07] M. Dorigo, M. Birattari, C. Blum, M. Clerc, T. Stützle, and A.F.T. Winfield (Eds.) (2008). *Ant Colony Optimization and Swarm Intelligence, 6th International Conference, ANTS 2008*, LNCS 5217. Springer, Berlin, Germany.
- [B06] T. Stützle, M. Birattari, and H. H. Hoos (Eds.) (2007). *Engineering Stochastic Local Search Algorithms: Designing, Implementing and Analyzing Effective Heuristics, International Workshop, SLS 2007*, LNCS 4638. Springer, Berlin, Germany.
- [B05] E. Ridge, T. Stützle, M. Birattari, and H. H. Hoos (Eds.) (2007). *SLS-DS 2007: Doctoral Symposium on Engineering Stochastic Local Search Algorithms*, IRIDIA–Technical Report Series, TR/IRIDIA/2007-018. IRIDIA, Université Libre de Bruxelles, Brussels, Belgium.

- [B04] D. Thierens, H.-G. Beyer, M. Birattari, J. Bongard, J. Branke, J.A. Clark, D. Cliff, C. B. Congdon, K. Deb, B. Doerr, T. Kovacs, S. Kumar, J.F. Miller, J. Moore, F. Neumann, M. Pelikan, R. Poli, K. Sastry, K.O. Stanley, T. Stützle, R.A. Watson, and I. Wegener (Eds.) (2007). *GECCO 2007: Genetic and Evolutionary Computation Conference*. ACM, New York, NY, USA.
- [B03] M. Dorigo, L. M. Gambardella, M. Birattari, A. Martinoli, R. Poli, and T. Stützle (Eds.) (2006). *Ant Colony Optimization and Swarm Intelligence, 5th International Workshop, ANTS 2006*, LNCS 4150. Springer, Berlin, Germany.
- [B02] M. Birattari (2005). *The Problem of Tuning Metaheuristics as Seen from a Machine Learning Perspective*. DISKI 292, Infix/Aka, Berlin, Germany.
- [B01] M. Dorigo, M. Birattari, C. Blum, L. M. Gambardella, F. Mondada, and T. Stützle (Eds.) (2004). *Ant Colony Optimization and Swarm Intelligence, 4th International Workshop, ANTS 2004*, LNCS 3172. Springer, Berlin, Germany.

---

THESES

- [T03] M. Birattari (2004). *The Problem of Tuning Metaheuristics as Seen from a Machine Learning Perspective*. Ph.D. Thesis, Université Libre de Bruxelles. Brussels, Belgium.
- [T02] M. Birattari (2001). *On the Formal Foundation of Ant Programming*. DEA Thesis, Université Libre de Bruxelles. Brussels, Belgium.
- [T01] M. Birattari (1997). *Modelli Locali per l'Apprendimento: Dall'approccio neuro-fuzzy al lazy learning*. Tesi di Laurea, Politecnico di Milano. Milan, Italy.

---

BOOK  
CHAPTERS AND  
ARTICLES IN  
POST-  
PROCEEDINGS  
OF  
CONFERENCES

- [C05] M. Birattari, Z. Yuan, P. Balaprakash, and T. Stützle (2010). F-race and iterated F-race: An overview. In T. Bartz-Beielstein, M. Chiarandini, L. Paquete, and M. Preuss (Eds.) *Empirical Methods for the Analysis of Optimization Algorithms*, Springer, Berlin, Germany. To appear.
- [C04] P. Balaprakash, M. Birattari, and T. Stützle (2008). Engineering stochastic local search algorithms: A case study in estimation-based local search for the probabilistic travelling salesman problem. In C. Cotta and J. van Hemert (Eds.) *Recent Advances in Evolutionary Computation for Combinatorial Optimization*, Studies in Computational Intelligence 153, pp. 53–66. Springer, Berlin, Germany.
- [C03] M. Birattari, P. Balaprakash, and M. Dorigo (2006). The ACO/F-RACE algorithm for combinatorial optimization under uncertainty. In K. F. Doerner, M. Gendreau, P. Greistorfer, W. J. Gutjahr, R. F. Hartl, and M. Reimann (Eds.) *Metaheuristics - Progress in Complex Systems Optimization*, pp. 189–203. Operations Research/Computer Science Interfaces Series, Springer, Berlin, Germany.
- [C02] O. Rossi-Doria, M. Sampels, M. Birattari, M. Chiarandini, M. Dorigo, L. M. Gambardella, J. Knowles, M. Manfrin, M. Mastrolilli, B. Paechter, L. Paquete, and T. Stützle (2003). A comparison of the performance of different metaheuristics on the timetabling problem. In E. Burke and P. D. Causmaecker (Eds.) *Practice and Theory of Automated Timetabling IV. 4th International Conference, PATAT 2002*, LNCS 2740, pp. 329–351. Springer, Berlin, Germany.
- [C01] G. Bontempi, M. Birattari, and H. Bersini (2001). Lazy learning: A local method for supervised learning, in L. C. Jain and J. Kacprzyk (Eds.) *New Learning Paradigms in Soft Computing*, pp. 97–137. Springer, Heidelberg, Germany.

---

ARTICLES IN  
REFEREED  
CONFERENCE  
PROCEEDINGS

- [P53] M.A. Montes de Oca, T. Stützle, M. Birattari, and M. Dorigo (2010). Incremental social learning applied to a decentralized decision-making mechanism: collective learning made faster. In I. Gupta, S. Hassas, and J. Rolia (Eds.) *Proceedings of the Fourth IEEE Conference on Self-Adaptive and Self-Organizing Systems, SASO 2010*, pp. 243–252, IEEE Computer Society Press. Los Alamitos, CA.
- [P52] E. Ferrante, A. E. Turgut, N. Mathews, M. Birattari, and M. Dorigo (2010). Flocking in stationary and non-stationary environments: A novel communication strategy for heading

- alignment. In R. Schaefer, C. Cotta, J. Kołodziej, and G. Rudolph (Eds.) *Parallel Problem Solving from Nature, PPSN XI: 11th International Conference*, LNCS 6239, pp. 331–340, Springer. Berlin, Germany.
- [P51] Z. Yuan, M. A. Montes de Oca, M. Birattari, and T. Stützle (2010). Modern continuous optimization algorithms for tuning real and integer algorithm parameters. In M. Dorigo, M. Birattari, G. A. Di Caro, R. Doursat, A. P. Engelbrecht, D. Floreano, L. M. Gambardella, R. Groß, E. Sahin, H. Sayama, and T. Stützle (Eds.) *Swarm Intelligence, 7th International Conference, ANTS 2010*, LNCS 6234, pp. 203–214, Springer. Berlin, Germany.
- [P50] P. Pellegrini and T. Stützle, and M. Birattari (2010). Off-line vs. on-line tuning: A study on MAX-MIN ant system for the TSP. In M. Dorigo, M. Birattari, G. A. Di Caro, R. Doursat, A. P. Engelbrecht, D. Floreano, L. M. Gambardella, R. Groß, E. Sahin, H. Sayama, and T. Stützle (Eds.) *Swarm Intelligence, 7th International Conference, ANTS 2010*, LNCS 6234, pp. 239–250, Springer. Berlin, Germany.
- [P49] M. A. Montes de Oca, E. Ferrante, N. Mathews, M. Birattari, and M. Dorigo (2010). Opinion dynamics for decentralized decision-making in a robot swarm. In M. Dorigo, M. Birattari, G. A. Di Caro, R. Doursat, A. P. Engelbrecht, D. Floreano, L. M. Gambardella, R. Groß, E. Sahin, H. Sayama, and T. Stützle (Eds.) *Swarm Intelligence, 7th International Conference, ANTS 2010*, LNCS 6234, pp. 251–262, Springer. Berlin, Germany.
- [P48] M. Frison, N.-L. Tran, N. Baiboun, A. Brutschy, G. Pini, A. Roli, M. Dorigo, and M. Birattari (2010). Adaptive task partitioning in swarms of homogeneous robots. In M. Dorigo, M. Birattari, G. A. Di Caro, R. Doursat, A. P. Engelbrecht, D. Floreano, L. M. Gambardella, R. Groß, E. Sahin, H. Sayama, and T. Stützle (Eds.) *Swarm Intelligence, 7th International Conference, ANTS 2010*, LNCS 6234, pp. 287–298, Springer. Berlin, Germany.
- [P47] E. Ferrante, M. Brambilla, M. Birattari, and M. Dorigo (2010). Look out!: Socially-mediated obstacle avoidance in collective transport. In M. Dorigo, M. Birattari, G. A. Di Caro, R. Doursat, A. P. Engelbrecht, D. Floreano, L. M. Gambardella, R. Groß, E. Sahin, H. Sayama, and T. Stützle (Eds.) *Swarm Intelligence, 7th International Conference, ANTS 2010*, LNCS 6234, pp. 572–573, Springer. Berlin, Germany.
- [P46] Z. Yuan, T. Stützle, and M. Birattari (2010). MADS/F-Race: Mesh adaptive direct search meets F-Race. In N. García-Pedrajas, H. Francisco, C. Fyfe, J.M. Benítez, and M. Ali (Eds.) *Trends in Applied Intelligent Systems, 23rd International Conference on Industrial Engineering and Other Applications of Applied Intelligent Systems, IEA/AIE 2010*, LNAI 6096, pp. 41–50. Springer, Berlin, Germany.
- [P45] M. Gagliolo, C. Legrand, and M. Birattari (2009). Mixed-effects modeling of optimisation algorithm performance. In T. Stützle, M. Birattari, and H. H. Hoos (Eds.) *Engineering Stochastic Local Search Algorithms, 2nd International Workshop, SLS 2009*, LNCS 5752, pp. 150–154. Springer. Berlin, Germany.
- [P44] M. Birattari, Z. Yuan, P. Balaprakash, T. Stützle (2009). Automated algorithm tuning using F-races: Recent developments. In S. Voss and M. Caserta (Eds.) *MIC 2009: The 8th Metaheuristics International Conference*, proceedings on CD-ROM, 10 pages.
- [P43] G. Pini, A. Brutschy, M. Birattari, and M. Dorigo (2009). Interference reduction through task partitioning in a robotic swarm. In J. Filipe, J. A. Cetto, and J.-L. Ferrier (Eds.) *ICINCO 2009: 6th International Conference on Informatics in Control, Automation and Robotics*, proceedings on CD-ROM, paper ID 156, 8 pages. INSTICC Press. Setúbal, Portugal.
- [P42] M. Brambilla, C. Pinciroli, M. Birattari, and M. Dorigo (2009). A reliable distributed algorithm for group size estimation with minimal communication requirements. In E. Prassler et al. (Eds.) *ICAR 2009: 14th International Conference on Advanced Robotics*, proceedings on CD-ROM, paper ID 137, 6 pages.
- [P41] A. Decugnière, B. Poulain, A. Campo, C. Pinciroli, B. Tartini, M. Osée, M. Dorigo, and M. Birattari (2008). Enhancing the cooperative transport of multiple objects. In M. Dorigo, M. Birattari, C. Blum, M. Clerc, T. Stützle, and A.F.T. Winfield (Eds.) *Ant Colony*

*Optimization and Swarm Intelligence, 6th International Conference, ANTS 2008*, LNCS 5217, pp. 307–314, Springer. Berlin, Germany.

[P40] C. Pinciroli, M. Birattari, E. Tuci, M. Dorigo, M. del Rey Zapatero, T. Vinko, and D. Izzo (2008). Lattice formation in space for a swarm of pico satellites. In M. Dorigo, M. Birattari, C. Blum, M. Clerc, T. Stützle, and A.F.T. Winfield (Eds.) *Ant Colony Optimization and Swarm Intelligence, 6th International Conference, ANTS 2008*, LNCS 5217, pp. 347–354, Springer. Berlin, Germany.

[P39] C. Pinciroli, M. Birattari, E. Tuci, M. Dorigo, M. del Rey Zapatero, T. Vinko, and D. Izzo (2008). Self-organizing and scalable shape formation for a swarm of pico satellites. In D. Keymeulen, T. Arslan, M. Suess, A. Stoica, A.T. Erdogan, and D. Merodio (Eds.) *2008 NASA/ESA Conference on Adaptive Hardware and Systems*, pp. 57–61. IEEE Computer Society, Los Alamitos, CA, USA.

[P38] R. Lenne, C. Solnon, T. Stützle, E. Tannier, and M. Birattari (2008). Reactive stochastic local search algorithms for the genomic median problem. In J. van Hemert and C. Cotta (Eds.) *Evolutionary Computation in Combinatorial Optimization, 8th European Conference, EvoCOP 2008*, LNCS 4972, pp. 266–276, Springer. Berlin, Germany.

[P37] P. Balaprakash, M. Birattari, T. Stützle (2007). Improvement strategies for the F-Race algorithm: Sampling design and iterative refinement. In T. Bartz-Beielstein, M. J. Blesa Aguilera, C. Blum, B. Naujoks, A. Roli, G. Rudolph, and M. Sampels (Eds.) *Hybrid Metaheuristics, 4th International Workshop, HM 2007*, LNCS 4771, pp. 108–122. Springer. Berlin, Germany.

[P36] A. L. Christensen, R. O’Grady, M. Birattari, and M. Dorigo (2007). Exogenous fault detection in a collective robotic task. In F. Almeida e Costa, L. Mateus, E. Costa, I. Harvey, and A. Coutinho (Eds.) *Advances in Artificial Life, 9th European Conference, ECAL 2007*, LNCS 4648, pp. 555–564. Springer. Berlin, Germany.

[P35] P. Pellegrini and M. Birattari (2007). Implementation effort and performance: A comparison of custom and out-of-the-box metaheuristics on the vehicle routing problem with stochastic demand. In T. Stützle, M. Birattari, and H. H. Hoos (Eds.) *Engineering Stochastic Local Search Algorithms: Designing, Implementing and Analyzing Effective Heuristics, International Workshop, SLS 2007*, LNCS 4638, pp. 31–45. Springer. Berlin, Germany.

[P34] A. L. Christensen, R. O’Grady, M. Birattari, and M. Dorigo (2007). Automatic synthesis of fault detection modules for mobile robots. In T. Arslan *et al.* (Eds.) *2007 NASA/ESA Conference on Adaptive Hardware and Systems*, pp. 693–700, IEEE Computer Society, Los Alamitos, CA, USA.

[P33] M. Birattari, P. Balaprakash, T. Stützle, and M. Dorigo (2007). Estimation-based local search for the probabilistic traveling salesman problem. In M. Gendreau, T. G. Crainic, L.-M. Rousseau, and P. Soriano (Eds.) *MIC 2007: The 7th Metaheuristics International Conference*, p. 141, CIRRELT, Montreal, Canada.

[P32] A. Campo, S. Nouyan, M. Birattari, R. Groß, and M. Dorigo (2006). Enhancing cooperative transport using negotiation of goal direction. In P.-Y. Schobbens, W. Vanhoof, and G. Schwanen (Eds.) *BNAIC 2006: 18th Belgium - Netherlands Conference on Artificial Intelligence*, pp. 365–366, University of Namur, Namur, Belgium.

[P31] M. Manfrin, M. Birattari, T. Stützle, and M. Dorigo (2006). Parallel Multicolony ACO Algorithm with Exchange of Solutions. In P.-Y. Schobbens, W. Vanhoof, and G. Schwanen (Eds.) *BNAIC 2006: 18th Belgium - Netherlands Conference on Artificial Intelligence*, pp. 409–410, University of Namur, Namur, Belgium.

[P30] M. Birattari, P. Pellegrini, and M. Dorigo (2006). On the invariance of ant system. In M. Dorigo, L. M. Gambardella, M. Birattari, A. Martinoli, R. Poli, and T. Stützle (Eds.), *Ant Colony Optimization and Swarm Intelligence, 5th International Workshop, ANTS 2006*, LNCS 4150, pp. 215–223. Springer. Berlin, Germany.

[P29] A. Campo, S. Nouyan, M. Birattari, R. Groß, and M. Dorigo (2006). Negotiation of goal direction for cooperative transport. In M. Dorigo, L. M. Gambardella, M. Birattari,

- A. Martinoli, R. Poli, and T. Stützle (Eds.), *Ant Colony Optimization and Swarm Intelligence, 5th International Workshop, ANTS 2006*, LNCS 4150, pp. 191–202. Springer. Berlin, Germany.
- [P28] M. A. Montes de Oca, T. Stützle, M. Birattari, and M. Dorigo (2006). A comparison of particle swarm optimization algorithms based on run-length distributions. In M. Dorigo, L. M. Gambardella, M. Birattari, A. Martinoli, R. Poli, and T. Stützle (Eds.), *Ant Colony Optimization and Swarm Intelligence, 5th International Workshop, ANTS 2006*, LNCS 4150, pp. 1–12. Springer. Berlin, Germany.
- [P27] P. Balaprakash, M. Birattari, T. Stützle, and M. Dorigo (2006). Incremental local search in ant colony optimization: Why it fails for the quadratic assignment problem. In M. Dorigo, L. M. Gambardella, M. Birattari, A. Martinoli, R. Poli, and T. Stützle (Eds.), *Ant Colony Optimization and Swarm Intelligence, 5th International Workshop, ANTS 2006*, LNCS 4150, pp. 156–166. Springer. Berlin, Germany.
- [P26] M. Manfrin, M. Birattari, T. Stützle, and M. Dorigo (2006). Parallel ant colony optimization for the traveling salesman problem. In M. Dorigo, L. M. Gambardella, M. Birattari, A. Martinoli, R. Poli, and T. Stützle (Eds.), *Ant Colony Optimization and Swarm Intelligence, 5th International Workshop, ANTS 2006*, LNCS 4150, pp. 224–234. Springer. Berlin, Germany.
- [P25] J. A. Sabino, T. Stützle, M. Birattari, and J. E. Leal (2006). Ant colony optimization applied to switch engine scheduling in a railroad yard. In M. Dorigo, L. M. Gambardella, M. Birattari, A. Martinoli, R. Poli, and T. Stützle (Eds.), *Ant Colony Optimization and Swarm Intelligence, 5th International Workshop, ANTS 2006*, LNCS 4150, pp. 502–503. Springer. Berlin, Germany.
- [P24] M. Birattari, P. Balaprakash, and M. Dorigo (2005). ACO/F-Race: Ant colony optimization and racing techniques for combinatorial optimization under uncertainty. In K. F. Doerner, M. Gendreau, P. Greistorfer, W. J. Gutjahr, R. F. Hartl, and M. Reimann (Eds.) *MIC 2005: The 6th Metaheuristics International Conference*, pp. 107–112. University of Vienna, Department of Business Administration, Vienna, Austria.
- [P23] G. Bontempi, M. Birattari, and P. E. Meyer (2005). Combining lazy learning, racing and subsampling for effective feature selection. In B. Ribeiro, R. F. Albrecht, A. Dobnikar, D. W. Pearson, and N. C. Steele (Eds.), *ICANNGA05: 7th International Conference on Adaptive and Natural Computing Algorithms*, pp. 393–396. Springer, Vienna, Austria.
- [P22] L. Bianchi, M. Birattari, M. Chiarandini, M. Manfrin, M. Mastrolilli, L. Paquete, O. Rossi-Doria, and T. Schiavinotto (2004). Metaheuristics for the Vehicle Routing Problem with Stochastic Demands. In X. Yao, E. Burke, J. A. Lozano, J. Smith, J. J. Merelo-Guervós, J. A. Bullinaria, J. Rowe, P. Tino, A. Kabán, and H.-P. Schwefel (Eds.), *Parallel Problem Solving from Nature, 8th International Conference, PPSN VIII*, LNCS 3242, pp. 450–460. Springer, Berlin, Germany.
- [P21] C. Piscopo and M. Birattari (2002). Invention vs. Discovery. A critical discussion. In S. Lange, K. Satoh, and C. H. Smith (Eds.), *Discovery Science. 5th International Conference, DS 2002*, LNSC 2534, pp. 457–462. Springer, Berlin, Germany.
- [P20] M. Birattari, G. Di Caro, and M. Dorigo (2002). Toward the formal foundation of Ant Programming. In M. Dorigo, G. Di Caro, and M. Sampels (Eds.), *Ant Algorithms, 3rd International workshop, ANTS 2002*. LNCS 2463, pp. 188–201. Springer, Berlin, Germany.
- [P19] O. Rossi-Doria, M. Sampels, M. Birattari, M. Chiarandini, M. Dorigo, L. M. Gambardella, J. Knowles, M. Manfrin, M. Mastrolilli, B. Paechter, L. Paquete, and T. Stützle (2002). A comparison of the performance of different metaheuristics on the timetabling problem. In E. Burke and P. De Causmaecker (Eds.), *PATAT 2002: Proceedings of the Fourth International Conference on the Practice and Theory of Automated Timetabling*, pp. 115–119. KaHo Sint-Lieven, Department of Industrial Engineering, Gent, Belgium.
- [P18] M. Birattari, T. Stützle, L. Paquete, and K. Varrentrapp (2002). A Racing Algorithm for Configuring Metaheuristics. In W. B. Langdon, E. Cantú-Paz, K. Mathias, R. Roy, D.

- Davis, R. Poli, K. Balakrishnan, V. Honavar, G. Rudolph, J. Wegener, L. Bull, M. A. Potter, A. C. Schultz, J. F. Miller, E. Burke, and N. Jonoska (Eds.), *GECCO 2002: Proceedings of the Genetic and Evolutionary Computation Conference*. pp. 11–18. Morgan Kaufmann, San Francisco, CA, USA.
- [P17] M. Dorigo, M. Zlochin, N. Meuleau, and M. Birattari (2002). Updating ACO pheromones using Stochastic Gradient Ascent and Cross-Entropy methods. In S. Cagnoni, J. Gottlieb, E. Hart, M. Middendorf, and R. Raidl (Eds.) *Applications of Evolutionary Computing. EvoWorkshops 2002: EvoCOP, EvoSTIM, EvoPLAN*, LNCS 2279, pp. 21–30. Springer, Berlin, Germany.
- [P16] E. Bertolissi, M. Birattari, G. Bontempi, A. Duchâteau, and H. Bersini (2000). Data-Driven Techniques for Divide and Conquer Adaptive Control. In V. Zakhharov (Ed.) *Control Applications of Optimization. Proceedings of the 11th IFAC International Workshop, CAO 2000*, pp. 70–75. Pergamon Press/Elsevier, Oxford, United Kingdom.
- [P15] E. Bertolissi, M. Birattari, G. Bontempi, A. Duchâteau, and H. Bersini (2000). Multiple Models for Adaptive Control: The Lazy and the Fuzzy Approach. In R. Smith (Ed.) *System Identification. A Proceedings volume from the 12th IFAC Symposium on System Identification. SYSID 2000*, Pergamon Press/Elsevier, Oxford, United Kingdom.
- [P14] G. Bontempi and M. Birattari (2000). A multi-step-ahead prediction method based on local dynamic properties. In M. Verleysen (Ed.) *ESANN 2000: European Symposium on Artificial Neural Networks*, pp. 311–316, D-Facto Publications, Brussels, Belgium.
- [P13] G. Bontempi, E. Bertolissi, and M. Birattari (2000). Predicting stock markets in boundary conditions with local models. In *CIFer 2000: Proceedings of the IEEE/IAFE/INFORMS Conference on Computational Intelligence for Financial Engineering*, pp. 158–161. New York, NY, USA. March 26–28, 2000.
- [P12] E. Bertolissi, M. Birattari, G. Bontempi, A. Duchâteau, and H. Bersini (2000). Lazy Learning vs. Fuzzy Systems: Two multiple-model approaches for adaptive control. In *ACIDCA 2000: International Conference on Artificial and Computational Intelligence for Decision, Control and Automation in Engineering and Industrial Applications*, pp. 6–11. Monastir, Tunisia. March 22–24, 2000.
- [P11] G. Bontempi and M. Birattari (1999). A bound on the cross-validation estimate for algorithm assessment. In E. Postma and M. Gyssens (Eds.) *BNAIC'99: Proceedings of the 11th Belgium-Netherlands Conference on Artificial Intelligence*, pp. 115–122. Universiteit Maastricht, Maastricht, The Netherlands.
- [P10] G. Bontempi, M. Birattari, and H. Bersini (1999). Lazy Learners at Work: The Lazy Learning Toolbox. In *EUFIT'99: The 7th European Congress on Intelligent Techniques and Soft Computing*, Aachen, Germany.
- [P09] G. Bontempi, M. Birattari, and H. Bersini (1999). Local learning for iterated time-series prediction. In I. Bradko and S. Dzeroski (Eds.) *ICML'99: International Conference on Machine Learning*, pp. 32–38. Morgan Kaufmann, San Francisco, CA, USA.
- [P08] M. Birattari, G. Bontempi, and H. Bersini (1999). Lazy learning meets the recursive least squares algorithm. In M. S. Kearns, S. A. Solla, and D. A. Cohn (Eds.) *NIPS'98: Advances in Neural Information Processing Systems 11*, pp. 375–381. MIT Press, Cambridge, MA, USA.
- [P07] G. Bontempi, M. Birattari, and H. Bersini (1998). Lazy learning for iterated time-series prediction. In J. A.K. Suykens and J. Vandewalle (Eds.) *International Workshop on Advanced Black-Box Techniques for Nonlinear Modeling*, pp. 62–68. K. U. Leuven, Leuven, Belgium.
- [P06] M. Birattari, G. Bontempi, and H. Bersini (1998). Local learning for data analysis. In F. Verdenius and W. van den Broek (Eds.) *Benelearn'98: Proceedings of the 8th Belgian-Dutch Conference on Machine Learning*, pp. 55–61. ATO-DLO, Wageningen, The Netherlands.

- [P05] G. Bontempi, M. Birattari, and H. Bersini (1998). Local learning for nonlinear control. In H. J.C. Huijberts and H. Nijmeijer (Eds.) *NOLCOS'98: Nonlinear Control Systems Design Symposium*, pp. 360–365. University of Twente, Enschede, The Netherlands.
- [P04] H. Bersini, G. Bontempi, and M. Birattari (1998). Is readability compatible with accuracy? From neuro-fuzzy to lazy learning. In W. Brauer (Ed.) *Fuzzy-Neuro Systems'98. Computational Intelligence: Proceedings of the 5th International Workshop on Fuzzy-Neuro Systems*, pp. 10–25. IOS Press, Amsterdam, The Netherlands.
- [P03] G. Bontempi, M. Birattari, and H. Bersini (1998). Lazy learning for control design. In M. Verleysen (Ed.) *ESANN'98: European Symposium on Artificial Neural Networks*, pp. 73–78, D-Facto Publications, Brussels, Belgium.
- [P02] G. Bontempi, M. Birattari, and H. Bersini (1998). Recursive lazy learning for modeling and control. In C. Nédellec and C. Rouveiroi (Eds.) *Machine Learning: ECML'98. 10th European Conference on Machine Learning*, LNCS 1398, pp. 292–303. Springer, Berlin, Germany.
- [P01] H. Bersini, M. Birattari, and G. Bontempi (1998). Adaptive memory based regression methods. In *IJCNN'98: Proceedings of the 1998 IEEE World Congress on Computational Intelligence*, pp. 2102–2106. IEEE Publications, Piscataway, NJ, USA.

---

ARTICLES  
PRESENTED AT  
WORKSHOPS  
(NO FORMAL  
PROCEEDINGS  
PUBLISHED)

- [W16] M. A. Montes de Oca, E. Ferrante, N. Mathews, M. Birattari, and M. Dorigo (2009) Optimal collective decision-making through social influence and different action execution times. In D. Curran and C. O’Riordan (Eds.) *Organisation, Cooperation and Emergence in Social Learning Agents – ECAL 2009 Workshop*. Budapest, Hungary.
- [W15] Z. Yuan, T. Stützle, and M. Birattari (2009) Combining F-Race and mesh adaptive direct search for automatic algorithm configuration. In F. Hutter and M. A. Montes de Oca (Eds.) *SLS-DS 2009: Doctoral Symposium on Engineering Stochastic Local Search Algorithms*, pp. 21–25. Brussels, Belgium.
- [W14] P. Balaprakash, M. Birattari, T. Stützle, and M. Dorigo (2008) Estimation-based stochastic local search algorithms for the stochastic routing problems. In E.-G. Talbi and K. Mellouli (Eds.) *International Conference on Metaheuristics and Nature Inspired Computing, META'08*. Hammamet, Tunisia.
- [W13] P. Balaprakash, M. Birattari, T. Stützle, and M. Dorigo (2008) Applications of estimation-based SLS algorithms to the stochastic routing problems. In P. Hansen and S. Voss (Eds.) *Metaheuristics 2008, Second International Workshop on Model Based Metaheuristics*. Bertinoro, Italy.
- [W12] P. Balaprakash, M. Birattari, T. Stützle, and M. Dorigo (2007). An experimental study of estimation-based metaheuristics for the probabilistic traveling salesman problem. In V. Maniezzo, R. Battiti, and J.-P. Watson (Eds.) *LION 2007 II: Learning and Intelligent Optimization*. Trento, Italy.
- [W11] R. Lenne, C. Solnon, T. Stützle, E. Tannier, and M. Birattari (2007). Effective stochastic local search algorithms for the genomic median problem. In E. Ridge, T. Stützle, M. Birattari, and H. H. Hoos (Eds.) *SLS-DS 2007: Doctoral Symposium on Engineering Stochastic Local Search Algorithms*, pp. 1–5. Brussels, Belgium.
- [W10] M. Montes de Oca, T. Stützle, M. Birattari, and M. Dorigo (2007). Composing particle swarm optimization algorithms. In E. Ridge, T. Stützle, M. Birattari, and H. H. Hoos (Eds.) *SLS-DS 2007: Doctoral Symposium on Engineering Stochastic Local Search Algorithms*, pp. 6–10. Brussels, Belgium.
- [W09] M. S. Bin Hussin, T. Stützle, and M. Birattari (2007). A study of stochastic local search algorithms for the quadratic assignment problem. In E. Ridge, T. Stützle, M. Birattari, and H. H. Hoos (Eds.) *SLS-DS 2007: Doctoral Symposium on Engineering Stochastic Local Search Algorithms*, pp. 11–15. Brussels, Belgium.

- [W08] P. Balaprakash, M. Birattari, T. Stützle, and M. Dorigo (2007). Sampling strategies and local search for stochastic combinatorial optimization. In E. Ridge, T. Stützle, M. Birattari, and H. H. Hoos (Eds.) *SLS-DS 2007: Doctoral Symposium on Engineering Stochastic Local Search Algorithms*, pp. 16–20. Brussels, Belgium.
- [W07] M. Manfrin, M. Birattari, T. Stützle, and M. Dorigo (2007). Communication policies for a parallel multi-colony ACO algorithm with identical colonies. In E. Ridge, T. Stützle, M. Birattari, and H. H. Hoos (Eds.) *SLS-DS 2007: Doctoral Symposium on Engineering Stochastic Local Search Algorithms*, pp. 31–35. Brussels, Belgium.
- [W06] T. T. Huynh, T. Stützle, M. Birattari, and Y. De Smet (2007). A study of ant colony optimization algorithms for a biobjective permutation flowshop problem. In E. Ridge, T. Stützle, M. Birattari, and H. H. Hoos (Eds.) *SLS-DS 2007: Doctoral Symposium on Engineering Stochastic Local Search Algorithms*, pp. 58–62. Brussels, Belgium.
- [W05] M. Birattari and T. Stützle (2006). F-Races: A tool for the automatic configuration of stochastic local search algorithms. In *ECCO XIX - CO2006 Joint Meeting*. Porto, Portugal.
- [W04] M. Manfrin, M. Birattari, and M. Dorigo (2005). Parallelization of ant colony optimization. In *Making Europe more attractive for researchers. A Marie Curie Action*. Pisa/Livorno, Italy.
- [W03] M. Chiarandini, T. Stützle, and M. Birattari (2005). Applying stochastic local search methods to timetabling: an engineering process. In R. De Leone, E. Marchitto, and A. G. Quaranta (Eds.) *XXXVI Annual Conference of the Italian Operational Research Society*, p. 74. Camerino, Italy.
- [W02] G. Bontempi and M. Birattari (1997). Lazy learning indirect control for discrete time non-linear systems. In T. A. Johansen and B. A. Foss (Eds.) *Abstracts of Workshop on Multiple Model Approaches to Modelling and Control*, pp. 72–80. Trondheim, Norway.
- [W01] H. Bersini, M. Birattari, and G. Bontempi (1997). Combining Dynamic Programming and Neurocontrol: Some Basic Issues. In H. Bersini, M. Dorigo, P. Y. Glorennec, L. Jouffe, and E. Anquetil (Eds.) *Third European Workshop on Reinforcement Learning*. Rennes, France.

---

TECHNICAL  
REPORTS

- [R80] P. Balaprakash, M. Birattari, T. Stützle, and M. Dorigo (2009). *Estimation-based metaheuristics for the probabilistic traveling salesman problem: A comparison to progressive approximation, the aggregation approach, and simulated annealing* Technical Report TR/IRIDIA/2009-025, IRIDIA, Université Libre de Bruxelles, Brussels, Belgium.
- [R79] M. A. Montes de Oca, E. Ferrante, N. Mathews, M. Birattari, and M. Dorigo (2009). *Optimal collective decision-making through social influence and different action execution times* Technical Report TR/IRIDIA/2009-023, IRIDIA, Université Libre de Bruxelles, Brussels, Belgium.
- [R78] M. Birattari, Z. Yuan, P. Balaprakash and T. Stützle (2009). *F-Race and Iterated F-Race: An overview* Technical Report TR/IRIDIA/2009-018, IRIDIA, Université Libre de Bruxelles, Brussels, Belgium.
- [R77] P. Balaprakash, M. Birattari, T. Stützle, and M. Dorigo (2009). *Estimation-based metaheuristics for the probabilistic traveling salesman problem* Technical Report TR/IRIDIA/2009-017, IRIDIA, Université Libre de Bruxelles, Brussels, Belgium.
- [R76] C. Twomey, T. Stützle, M. Dorigo, M. Manfrin and M. Birattari (2009). *An analysis of communication policies for homogeneous multi-colony ACO algorithms* Technical Report TR/IRIDIA/2009-012, IRIDIA, Université Libre de Bruxelles, Brussels, Belgium.
- [R75] G. Pini, A. Brutschy, M. Birattari, and M. Dorigo (2009). *Interference reduction through task partitioning in a robotic swarm* Technical Report TR/IRIDIA/2009-006, IRIDIA, Université Libre de Bruxelles, Brussels, Belgium.
- [R74] C. Piscopo and M. Birattari (2009). *On the role of correspondence in the similarity approach*. Technical Report TR/IRIDIA/2009-003, IRIDIA, Université Libre de Bruxelles, Brussels, Belgium.

- [R73] P. Balaprakash, M. Birattari, T. Stützle, Z. Yuan, and M. Dorigo (2008). *Estimation-based ant colony optimization and local search for the probabilistic traveling salesman problem*. Technical Report TR/IRIDIA/2008-020, IRIDIA, Université Libre de Bruxelles, Brussels, Belgium.
- [R72] A. Decugnière, B. Poulain, A. Campo, C. Pinciroli, B. Tartini, M. Osée, M. Dorigo, and M. Birattari (2008). *The cart-bot and the cooperative transport of multiple objects in the swarmanoid project*. Technical Report TR/IRIDIA/2008-014, IRIDIA, Université Libre de Bruxelles, Brussels, Belgium.
- [R71] C. Piscopo and M. Birattari (2008). *The explanation of the success of science*. Technical Report TR/IRIDIA/2008-013, IRIDIA, Université Libre de Bruxelles, Brussels, Belgium.
- [R70] C. Pinciroli, M. Birattari, E. Tuci, M. Dorigo, M. del Rey Zapatero, T. Vinko, and D. Izzo (2008). *Self-organizing and scalable shape formation for a swarm of pico satellites*. Technical Report TR/IRIDIA/2008-009, IRIDIA, Université Libre de Bruxelles, Brussels, Belgium.
- [R69] P. Balaprakash, M. Birattari, and T. Stützle (2007). *Engineering stochastic local search algorithms: A case study in estimation-based local search for the probabilistic traveling salesman problem*. Technical Report TR/IRIDIA/2007-022, IRIDIA, Université Libre de Bruxelles, Brussels, Belgium.
- [R68] P. Balaprakash, M. Birattari, T. Stützle, and M. Dorigo (2007). *An experimental study of estimation-based metaheuristics for the probabilistic traveling salesman problem*. Technical Report TR/IRIDIA/2007-021, IRIDIA, Université Libre de Bruxelles, Brussels, Belgium.
- [R67] C. Piscopo and M. Birattari (2007). *On the use of probability in artificial intelligence: The metaphysical character of the non-adequacy claim*. Technical Report TR/IRIDIA/2007-018, IRIDIA, Université Libre de Bruxelles, Brussels, Belgium.
- [R66] P. Balaprakash, M. Birattari, T. Stützle, and M. Dorigo (2007). *Adaptive sample size and importance sampling in estimation-based local search for stochastic combinatorial optimization: A complete analysis*. Technical Report TR/IRIDIA/2007-015, IRIDIA, Université Libre de Bruxelles, Brussels, Belgium.
- [R65] E. Ridge, T. Stützle, M. Birattari, and H. H. Hoos. (Eds.) (2007). *SLS-DS 2007: Doctoral symposium on engineering stochastic local search algorithms*. Technical Report TR/IRIDIA/2007-014, IRIDIA, Université Libre de Bruxelles, Brussels, Belgium.
- [R64] P. Balaprakash, M. Birattari, T. Stützle, and M. Dorigo (2007). *Sampling strategies and local search for stochastic combinatorial optimization*. Technical Report TR/IRIDIA/2007-012, IRIDIA, Université Libre de Bruxelles, Brussels, Belgium.
- [R63] P. Balaprakash, M. Birattari, and T. Stützle (2007). *Improvement strategies for the F-Race algorithm: Sampling design and iterative refinement*. Technical Report TR/IRIDIA/2007-011, IRIDIA, Université Libre de Bruxelles, Brussels, Belgium.
- [R62] A. L. Christensen, R. O’Grady, M. Birattari, and M. Dorigo (2007). *Exogenous fault detection in a collective robotic task*. Technical Report TR/IRIDIA/2007-010, IRIDIA, Université Libre de Bruxelles, Brussels, Belgium.
- [R61] M. A. Montes de Oca, T. Stützle, M. Birattari, and M. Dorigo (2007). *Frankenstein’s PSO: An Engineered Composite Particle Swarm Optimization Algorithm*. Technical Report TR/IRIDIA/2007-006, IRIDIA, Université Libre de Bruxelles, Brussels, Belgium.
- [R60] A. L. Christensen, R. O’Grady, M. Birattari and M. Dorigo (2007). *Fault Detection in Autonomous Robots Based on Fault Injection and Learning*. Technical Report TR/IRIDIA/2007-004, IRIDIA, Université Libre de Bruxelles, Brussels, Belgium.
- [R59] M. Birattari, P. Balaprakash, T. Stützle, and M. Dorigo (2007). *Estimation-based Local Search for Stochastic Combinatorial Optimization*. Technical Report TR/IRIDIA/2007-003, IRIDIA, Université Libre de Bruxelles, Brussels, Belgium.

- [R58] C. Piscopo and M. Birattari (2007). *Philippe Smets and the Transferable Belief Model: An epistemological perspective*. Technical Report TR/IRIDIA/2007-001, IRIDIA, Université Libre de Bruxelles, Brussels, Belgium.
- [R57] P. Pellegrini and M. Birattari (2006). *Some Combinatorial Optimization Problems on which Ant Colony Optimization is Invariant*. Technical Report TR/IRIDIA/2006-026, IRIDIA, Université Libre de Bruxelles, Brussels, Belgium.
- [R56] M. Birattari, P. Pellegrini, and M. Dorigo (2006). *On the Invariance of Ant Colony Optimization*. Technical Report TR/IRIDIA/2006-025, IRIDIA, Université Libre de Bruxelles, Brussels, Belgium.
- [R55] M. Dorigo, M. Birattari, and T. Stützle (2006). *Ant Colony Optimization. Artificial Ants as a Computational Intelligence Technique*. Technical Report TR/IRIDIA/2006-023, IRIDIA, Université Libre de Bruxelles, Brussels, Belgium.
- [R54] A. Campo, S. Nouyan, M. Birattari, R. Groß, and M. Dorigo (2006). *Negotiation of goal direction for cooperative transport*. Technical Report TR/IRIDIA/2006-014, IRIDIA, Université Libre de Bruxelles, Brussels, Belgium.
- [R53] M. A. Montes de Oca, T. Stützle, M. Birattari, and M. Dorigo (2006). *A comparison of particle swarm optimization algorithms based on run-length distributions*. Technical Report TR/IRIDIA/2006-013, IRIDIA, Université Libre de Bruxelles, Brussels, Belgium.
- [R52] P. Balaprakash, M. Birattari, T. Stützle, and M. Dorigo (2006). *Incremental local search in ant colony optimization: Why it fails for the quadratic assignment problem*. Technical Report TR/IRIDIA/2006-011, IRIDIA, Université Libre de Bruxelles, Brussels, Belgium.
- [R51] P. Pellegrini and M. Birattari (2006). *The relevance of tuning the parameters of metaheuristics. A case study: The vehicle routing problem with stochastic demand*. Technical Report TR/IRIDIA/2006-008: IRIDIA, Université Libre de Bruxelles, Brussels, Belgium.
- [R50] M. Manfrin, M. Birattari, T. Stützle, and M. Dorigo (2006). *Parallel Ant Colony Optimization for the Traveling Salesman Problem*. Technical Report TR/IRIDIA/2006-007: IRIDIA, Université Libre de Bruxelles, Brussels, Belgium.
- [R49] M. Birattari, P. Pellegrini, and M. Dorigo (2006). *On the Invariance of Ant Colony Optimization for the Traveling Salesman Problem*. Technical Report TR/IRIDIA/2006-004: IRIDIA, Université Libre de Bruxelles, Brussels, Belgium.
- [R48] M. Birattari, P. Pellegrini, and M. Dorigo (2005). *On the invariance of Ant System*. Technical Report TR/IRIDIA/2005-036: IRIDIA, Université Libre de Bruxelles, Brussels, Belgium.
- [R47] S. Nouyan, R. Ghizzioli, M. Birattari, and M. Dorigo (2005). *An Insect-Based Algorithm for the Dynamic Task Allocation Problem*. Technical Report TR/IRIDIA/2005-031: IRIDIA, Université Libre de Bruxelles, Brussels, Belgium.
- [R46] M. Birattari, M. Zlochin, and M. Dorigo (2005). *Towards a Theory of Practice in Metaheuristics Design. A Machine Learning Perspective*. Technical Report TR/IRIDIA/2005-030: IRIDIA, Université Libre de Bruxelles, Brussels, Belgium.
- [R45] P. Pellegrini and M. Birattari (2005). *Instance generator for the vehicle routing problem with stochastic demand*. Technical Report TR/IRIDIA/2005-010: IRIDIA, Université Libre de Bruxelles, Brussels, Belgium.
- [R44] L. Bianchi, M. Birattari, M. Chiarandini, M. Manfrin, M. Mastrolilli, L. Paquete, O. Rossi-Doria, and T. Schiavinotto (2005). *Hybrid Metaheuristics for the vehicle routing problem with stochastic demands*. Technical Report IDSIA-06-05. IDSIA, Lugano, Switzerland.
- [R43] M. Birattari and M. Dorigo (2005). *How to assess and report the performance of a stochastic algorithm on a benchmark problem: Mean or best result on a number of runs?* Technical Report TR/IRIDIA/2005-007: IRIDIA, Université Libre de Bruxelles, Brussels, Belgium.

- [R42] M. Birattari (2005). *The IridiaTrCover package for L<sup>A</sup>T<sub>E</sub>X: How to typeset documents for the IRIDIA – Technical Report Series*. Technical Report TR/IRIDIA/2005-006: IRIDIA, Université Libre de Bruxelles, Brussels, Belgium.
- [R41] R. Ghizzioli, S. Nouyan, M. Birattari, and M. Dorigo (2005). *An ant-based algorithm for the heterogeneous dynamic task allocation problem*. Technical Report TR/IRIDIA/2005-005: IRIDIA, Université Libre de Bruxelles, Brussels, Belgium.
- [R40] M. Birattari, P. Balaprakash, and M. Dorigo (2005). *ACO/F-Race: Ant colony optimization and racing techniques for combinatorial optimization under uncertainty*. Technical Report TR/IRIDIA/2005-004: IRIDIA, Université Libre de Bruxelles, Brussels, Belgium.
- [R39] M. Birattari (2004). *Notes on the existence of the expected value*. Technical Report TR/IRIDIA/2004-020: IRIDIA, Université Libre de Bruxelles, Brussels, Belgium.
- [R38] R. Ghizzioli, S. Nouyan, M. Birattari, and M. Dorigo (2004). *An Ant-Based Algorithm for the Dynamic Task Allocation Problem*. Technical Report TR/IRIDIA/2004-016: IRIDIA, Université Libre de Bruxelles, Brussels, Belgium.
- [R37] T. H. Labelle and M. Birattari (2004). *Polyphemus: De Abacorum Racemo*. Technical Report TR/IRIDIA/2004-015: IRIDIA, Université Libre de Bruxelles, Brussels, Belgium.
- [R36] L. Bianchi, M. Birattari, M. Chiarandini, M. Manfrin, M. Mastrolilli, L. Paquete, and O. Rossi-Doria (2004). *Research on the vehicle routing problem with stochastic demand*. Technical Report IDSIA-07-04. IDSIA, Lugano, Switzerland.
- [R35] G. Bontempi, M. Birattari, and P. E. Meyer (2004). *Combining lazy learning, racing and subsampling for effective feature selection*. Technical Report 527: Département d’Informatique, Université Libre de Bruxelles, Brussels, Belgium.
- [R34] G. Bontempi and M. Birattari (2004). *Sample average approximation for model selection*. Technical Report 525: Département d’Informatique, Université Libre de Bruxelles, Brussels, Belgium.
- [R33] L. Bianchi, M. Birattari, M. Chiarandini, M. Manfrin, M. Mastrolilli, L. Paquete, O. Rossi-Doria, and T. Schiavinotto (2004). *Metaheuristics for the vehicle routing problem with stochastic demands*. Technical Report IDSIA-06-04. IDSIA, Lugano, Switzerland.
- [R32] M. Birattari (2004). *On the estimation of the expected performance of a metaheuristic on a class of instances. How many instances, how many runs?* Technical Report TR/IRIDIA/2004-001: IRIDIA, Université Libre de Bruxelles, Brussels, Belgium.
- [R31] M. Zlochin, M. Birattari, and M. Dorigo (2004). *Towards a Theory of Practice in Metaheuristics Design. A machine learning perspective*, Technical Report MCS04-01. Computer Science and Applied Mathematics, The Weizmann Institute of Science, Rehovot, Israel.
- [R30] M. Birattari and G. Bontempi (2003). *The lazy package for R. Lazy learning for local regression*, Technical Report TR/IRIDIA/2003-038: IRIDIA, Université Libre de Bruxelles, Brussels, Belgium.
- [R29] M. Birattari (2003). *The race package for R. Racing methods for the selection of the best*, Technical Report TR/IRIDIA/2003-037: IRIDIA, Université Libre de Bruxelles, Brussels, Belgium.
- [R28] C. Piscopo and M. Birattari (2003). *Metaphysical Arguments in Artificial Intelligence: A case study*. Technical Report TR/IRIDIA/2003-026: IRIDIA, Université Libre de Bruxelles, Brussels, Belgium.
- [R27] M. Chiarandini, M. Birattari, K. Socha, and O. Rossi-Doria (2003). *An effective hybrid approach for the university course timetabling problem*. Technical Report AIDA-03-05: Fachgebiet Intellektik, Fachbereich Informatik, Technische Universität Darmstadt, Darmstadt, Germany.
- [R26] M. Chiarandini, K. Socha, M. Birattari, and O. Rossi-Doria (2003). *International timetabling competition. A hybrid approach*. Technical Report AIDA-03-04: Fachgebiet Intellektik, Fachbereich Informatik, Technische Universität Darmstadt, Darmstadt, Germany.

- [R25] C. Piscopo and M. Birattari (2002). *Probabilistic models in artificial intelligence. An epistemological analysis of the debate on their adequacy*. Technical Report TR/IRIDIA/2002-026: IRIDIA, Université Libre de Bruxelles, Brussels, Belgium.
- [R24] O. Rossi-Doria, M. Sampels, J. Knowles, M. Manfrin, M. Birattari, M. Chiarandini, M. Mastrolilli, B. Paechter, M. Dorigo, L. M. Gambardella, L. Paquete, and T. Stützle (2002). *A comparison of the performance of different metaheuristics on the timetabling problem*. Technical Report IDSIA-18-02. IDSIA, Lugano, Switzerland.
- [R23] C. Piscopo and M. Birattari (2002). *Invention vs. Discovery. A Critical Discussion*. Technical Report TR/IRIDIA/2002-013: IRIDIA, Université Libre de Bruxelles, Brussels, Belgium.
- [R22] C. Piscopo and M. Birattari (2002). *Probability theory and intrinsically non-stochastic phenomena in AI: How to reject a metaphysical issue*, Technical Report AIDA-02-04: Fachgebiet Intellektik, Fachbereich Informatik, Technische Universität Darmstadt, Darmstadt, Germany.
- [R21] M. Birattari, T. Stützle, L. Paquete, and K. Varrentrapp (2002). *A Racing Algorithm for Configuring Metaheuristics*. Technical Report AIDA-02-01: Fachgebiet Intellektik, Fachbereich Informatik, Technische Universität Darmstadt, Darmstadt, Germany.
- [R20] M. Dorigo, M. Zlochin, N. Meuleau, and M. Birattari (2001). *Updating ACO pheromones using Stochastic Gradient Ascent and Cross-Entropy methods*. Technical Report TR/IRIDIA/2001-019: IRIDIA, Université Libre de Bruxelles, Brussels, Belgium.
- [R19] M. Zlochin, M. Birattari, N. Meuleau, and M. Dorigo (2001). *Model-based Search for Combinatorial Optimization*, Technical Report TR/IRIDIA/2001-015: IRIDIA, Université Libre de Bruxelles, Brussels, Belgium.
- [R18] M. Birattari, L. Paquete, T. Stützle, and K. Varrentrapp (2001). *Classification of Metaheuristics and Design of Experiments for the Analysis of Components*, Technical Report AIDA-01-05: Fachgebiet Intellektik, Fachbereich Informatik, Technische Universität Darmstadt, Darmstadt, Germany.
- [R17] E. Bertolissi, M. Birattari, G. Bontempi, A. Duchâteau, and H. Bersini (2001). *Data-driven techniques for direct adaptive control: The lazy and the fuzzy approaches*. Technical Report TR/IRIDIA/2001-004. IRIDIA, Université Libre de Bruxelles, Brussels, Belgium.
- [R16] C. Piscopo, M. Birattari, and A. Saffiotti (2001). *Some philosophical issues about the treatment of uncertainty in artificial intelligence*, Technical Report No. 3 in Studies from the Department of Technology at Örebro University, ISSN 1404-7225: Örebro University, Örebro, Sweden.
- [R15] M. Birattari, G. Di Caro, and M. Dorigo (2000). *For a formal foundation of the Ant Programming approach to combinatorial optimization. Part 1: The problem, the representation, and the general solution strategy*, Technical Report TR-H-301: ATR Human Information Processing Research Laboratories, Kyoto, Japan.
- [R14] E. Bertolissi, M. Birattari, G. Bontempi, A. Duchâteau, and H. Bersini (2000). *Data-Driven Techniques for Divide-and-Conquer Adaptive Control*. Technical Report TR/IRIDIA/-2000-025: IRIDIA, Université Libre de Bruxelles. Brussels, Belgium.
- [R13] E. Bertolissi, M. Birattari, G. Bontempi, A. Duchâteau, and H. Bersini (2000). *Multiple models for adaptive control: The lazy and the fuzzy Approach*. Technical Report TR/IRIDIA/-2000-023: IRIDIA, Université Libre de Bruxelles. Brussels, Belgium.
- [R12] G. Bontempi, E. Bertolissi, and M. Birattari (2000). *Predicting stock markets in boundary conditions with local models*. Technical Report TR/IRIDIA/2000-022: IRIDIA, Université Libre de Bruxelles. Brussels, Belgium.
- [R11] G. Bontempi, M. Birattari, and H. Bersini (2000). *A model selection approach for local learning*. Technical Report TR/IRIDIA/2000-016: IRIDIA, Université Libre de Bruxelles. Brussels, Belgium.

- [R10] E. Bertolissi, M. Birattari, G. Bontempi, A. Duchâteau, and H. Bersini (2000). *Lazy learning vs. fuzzy systems: Two multiple-model approaches for adaptive control*. Technical Report TR/IRIDIA/2000-003: IRIDIA, Université Libre de Bruxelles. Brussels, Belgium.
- [R09] M. Birattari (1999). *First Project: IRIDIA & FaFer*. Technical Report TR/IRIDIA/1999-013: IRIDIA, Université Libre de Bruxelles. Brussels, Belgium.
- [R08] G. Bontempi and M. Birattari (1999). *A bound on the cross-validation estimate for algorithm assessment*. Technical Report TR/IRIDIA/1999-010: IRIDIA, Université Libre de Bruxelles. Brussels, Belgium.
- [R07] G. Bontempi and M. Birattari (1999). *Toolbox for Neuro-Fuzzy Identification and Data Analysis. For use with Matlab*, Technical Report TR/IRIDIA/1999-009: IRIDIA, Université Libre de Bruxelles. Brussels, Belgium.
- [R06] M. Birattari and G. Bontempi (1999). *The Lazy Learning Toolbox. For Use with Matlab*, Technical Report TR/IRIDIA/1999-007: IRIDIA, Université Libre de Bruxelles. Brussels, Belgium.
- [R05] M. Birattari and G. Bontempi (1999). *Lazy Learning Vs. Speedy Gonzales: A fast algorithm for recursive identification and recursive validation of local constant models*, Technical Report TR/IRIDIA/1999-006: IRIDIA, Université Libre de Bruxelles. Brussels, Belgium.
- [R04] G. Bontempi, M. Birattari, and H. Bersini (1999). *Local learning for iterated time series prediction*. Technical Report TR/IRIDIA/1999-004: IRIDIA, Université Libre de Bruxelles. Brussels, Belgium.
- [R03] M. Birattari, G. Bontempi, and H. Bersini (1998). *Lazy learning meets the recursive least squares algorithm*. Technical Report TR/IRIDIA/1998-002: IRIDIA, Université Libre de Bruxelles. Brussels, Belgium.
- [R02] G. Bontempi, M. Birattari, and H. Bersini (1997). *Lazy learning for modeling and control design*. Technical Report TR/IRIDIA/1997-016: IRIDIA, Université Libre de Bruxelles. Brussels, Belgium.
- [R01] H. Bersini, G. Bontempi, and M. Birattari (1997). *Adaptive Memory-Based Regression Methods*, Technical Report TR/IRIDIA/1997-013: IRIDIA, Université Libre de Bruxelles. Brussels, Belgium.