

Carlo Pinciroli

Université Libre de Bruxelles
IRIDIA – CoDE
50 Avenue F. Roosevelt - CP 194/6
1050 Bruxelles
Belgium

Office: (+32) (0) 2650 2730
Fax: (+32) (0) 2650 2715
Email: cpinciro@ulb.ac.be

Homepage: <http://iridia.ulb.ac.be/~cpinciroli/>

EDUCATION

Ph.D. in Computer Engineering, Université Libre de Bruxelles, Belgium,
expected March 2011.

Committee: [Marco Dorigo](#), [Mauro Birattari](#)

Diplôme d'Études Approfondies, Université Libre de Bruxelles, Belgium,
2007.

Master in Computer Science, University of Illinois at Chicago, USA, 2005.

Laurea (Master) in Computer Science Engineering, Politecnico di Milano,
Italy, 2005.

TEACHING AND RESEARCH FIELDS

Artificial Intelligence, Swarm Intelligence, Swarm Robotics, Computer Vision.

ACADEMIC EXPERIENCE

Université Libre de Bruxelles, IRIDIA – CoDE

Teaching Assistant, Swarm Intelligence, Spring 2009 and Spring 2010.

Politecnico di Milano, Dipartimento di Elettronica e Informazione

Laboratory Tutor, Introduction to Computer Science, Fall 2004–Spring 2005.

RESEARCH

Work in Progress

[Swarmanoid project](#) (October 2006–September 2010) Development of controllers for the three different kinds of robots built in the project: foot-bot (ground based), hand-bot (climbing and manipulation), eye-bot (aerial).

Past Projects

Project within the [Ariadna](#) program of the [Advanced Concepts Team \(ACT\)](#) of the [European Space Agency \(ESA\)](#) (October 2007–January 2008). The project aimed at applying the concepts of swarm intelligence to tackle the problem of autonomously displacing swarms of satellites in a hexagonal formation in a scalable manner.

Power optimisation of embedded systems (POET) project (June 2003–January 2005) Development of modules and extensions for the Tribes toolkit.

Publications

Rehan O’Grady, Anders L. Christensen, Carlo Pinciroli, Marco Dorigo. *Robots Autonomously Self-Assemble into Dedicated Morphologies to Solve Different Tasks*. Proceedings of the 9th International Conference on Autonomous Agents and Multiagent Systems (AAMAS 2010). In press.

Rehan O’Grady, Carlo Pinciroli, Roderich Gro, Anders L. Christensen, Francesco Mondada, Michael Bonani, Marco Dorigo. *Swarm-bots to the Rescue*. European Conference on Artificial Life (ECAL 2009). In press.

Carlo Pinciroli, Rehan O’Grady, Anders L. Christensen, Marco Dorigo. *Self-Organised Recruitment in a Heterogeneous Swarm*. 14th International Conference on Advanced Robotics (ICAR 2009). Proceedings on CD-ROM, paper ID 176, 8 pages.

Manuele Brambilla, Carlo Pinciroli, Mauro Birattari, Marco Dorigo. *A Reliable Distributed Algorithm for Group Size Estimation with Minimal Communication Requirements*. 14th International Conference on Advanced Robotics (ICAR 2009). Proceedings on CD-ROM, paper ID 137, 6 pages.

Rehan O’Grady, Carlo Pinciroli, Anders L. Christensen, Marco Dorigo. *Supervised Group Size Regulation in a Heterogeneous Robotic Swarm*. 9th Conference on Autonomous Robot Systems and Competitions (Robtica 2009), pages 113-119, May 2009. IPCB, Castelo Branco, Portugal.

Marco A. Montes de Oca, Jorge Peña, Thomas Stützle, Carlo Pinciroli and Marco Dorigo. *Heterogeneous Particle Swarm Optimizers*. IEEE Congress on Evolutionary Computation (CEC) 2009. Accepted for publication.

Carlo Pinciroli, Mauro Birattari, Elio Tuci, Marco Dorigo, Marco Del Rey Zapatero, Tamas Vinko, Dario Izzo. *Lattice Formation in Space for a Swarm of Pico Satellites*. The Sixth International Conference on Ant Colony Optimization and Swarm Intelligence (ANTS-2008), pages 347-354, September 2008. Springer LNCS, Berlin, Germany.

Álvaro Gutiérrez, Alexandre Campo, Francisco C. Santos, Carlo Pinciroli, Marco Dorigo. *Social Odometry in Populations of Autonomous Robots*. The

Sixth International Conference on Ant Colony Optimization and Swarm Intelligence (ANTS-2008), pages 371-378, September 2008. Springer LNCS, Berlin, Germany.

Antoine Decugnière, Benjamin Poulain, Alexandre Campo, Carlo Pinciroli, Bruno Tartini, Michel Osée, Marco Dorigo, Mauro Birattari. *Enhancing the Cooperative Transport of Multiple Robots*. The Sixth International Conference on Ant Colony Optimization and Swarm Intelligence (ANTS-2008), pages 307-314, September 2008. Springer LNCS, Berlin, Germany.

Carlo Pinciroli, Mauro Birattari, Elio Tuci, Marco Dorigo, Marco Del Rey Zapatero, Tamas Vinko, Dario Izzo. *Self-Organizing and Scalable Shape Formation for a Swarm of Pico Satellites*. Proceedings of the NASA/ESA Conference on Adaptive Hardware and Systems (AHS-2008), pages 57-61, June 2008. IEEE-CS Press, Washington, DC, USA.

Carlo Pinciroli, Andrea Bonarini, Matteo Matteucci. *Robust Detection of 3D Scene Horizontal and Vertical Lines in Conical Catadioptric Sensors*. Proceedings of the 6th Workshop on Omnidirectional Vision, Camera Networks and Non-classical cameras (OMNIVIS 2005).

Francesco Amigoni, Nicola Gatti, Carlo Pinciroli, Manuel Roveri. *What Planner for Ambient Intelligence Applications?* IEEE Transactions on Systems, Man, and Cybernetics, Part A: Systems and Humans: Volume 35, Issue 1, pages 7-21, January 2005. Special Issue on Ambient Intelligence, IEEE Press.

Scientific Software

[ARGoS](#), a multi-engine 3D physics simulator, developed for the [Swarmanoid project](#).

INVITED TALKS

Seminars

Evolving a Collective Consciousness for a Swarm of Pico Satellites. Seminar at the European Space Research and Technology Centre, ESA, Noordwijk, The Netherlands. May 7th, 2008.

Robust Detection of 3D Scene Horizontal and Vertical Lines in Conical Catadioptric Sensors. Seminar at IRIDIA, Université Libre de Bruxelles, Brussels, Belgium. May 19th, 2006.

PROFESSIONAL ACTIVITIES

Conferences, Workshops and Summer Schools Attended

European Conference on Artificial Life (ECAL 2009), Budapest, Hungary, September 13–16, 2009

The 14th International Conference on Advanced Robotics (ICAR 2009), Munich, Germany, June 22–26, 2009.

The Sixth International Conference on Ant Colony Optimization and Swarm Intelligence (ANTS 2008), Brussels, Belgium, September 22–24, 2008.

NASA/ESA Conference on Adaptive Hardware and Systems (AHS-2008), European Space Research and Technology Centre, ESA, Noordwijk, The Netherlands, June 22–25, 2008.

Summer School in Collective Robotics (EAIA07), Lisboa, Portugal, August 27–31, 2007.

Refereeing

Books: *Applied Swarm Intelligence*

Journals: *Evolutionary Computation*

Conferences: *Self-Adapting and Self-Organizing Systems (SASO) 2007*, *Biologically Inspired Collaborative Computing (BICC) 2008*

FELLOWSHIPS

[Swarmanoid project](#) Fellowship (September 2006–March 2007, March 2008–September 2010)

Marie Curie Fellowship within the [Comp2SYS](#) program (March 2007–March 2008)

MISCELLANEOUS

Computer Skills

Operating systems: Windows, Linux.

Programming: C, C++, Java, J2EE, Bash, Perl, AWK, Matlab, R, SQL, Flex, Bison.

Other: \LaTeX , Gnuplot, Dot.

Languages

Mothertongue: Italian

Excellent: English

Fluent: French

REFERENCES

Marco Dorigo
Research Director
Université Libre de Bruxelles
(+32) (0) 2 650 3169
mdorigo@ulb.ac.be

Andrea Bonarini
Associate Professor
Politecnico di Milano
(+39) (0) 2 2399 3525
bonarini@elet.polimi.it

Mauro Birattari
Research Associate
Université Libre de Bruxelles
(+32) (0) 2 650 3169
mbiro@ulb.ac.be

Carlo Brandolese
Researcher
Cefriel Research Centre
(+39) (0) 2 23954 325
brandole@cefriel.it

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<http://iridia.ulb.ac.be/~cpincioli/carlo.pincioli.cv.pdf>