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Proceedings of the Fourth International Conference on Autonomic and Autonomous Systems (ICAS'08) - Volume 00 [table of contents](#)
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ISBN:978-0-7695-3093-2**Authors** [Anderson Luiz Fernandes Perez](#)
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[Mauro Roisenberg](#)**Publisher** IEEE Computer Society Washington, DC, USA**Bibliometrics** Downloads (6 Weeks): n/a, Downloads (12 Months): n/a, Citation Count: 0**Additional Information:** [abstract](#) [index terms](#) [collaborative colleagues](#)**Tools and Actions:** [Review this Article](#)
[Save this Article to a Binder](#) Display Formats: [BibTex](#) [EndNote](#) [ACM Ref](#)**DOI Bookmark:** [10.1109/ICAS.2008.31](#) **ABSTRACT**

Embodied Evolution is a research area in Evolutionary Robotics in which the evolutionary algorithm is entirely decentralized among a population of robots. Evaluation, selection and reproduction are carried out by and between the robots, without any need for human intervention. This paper describes a new Evolutionary Control System (ECS) able to control a population of mobile robots. The ECS is based on a Genetic Programming algorithm and has two main modules. The first one, called EMSS (Execution, Management and Supervision System), is the system responsible for managing all the evolutionary process in each robot. The second module, called DGP (Distributed Genetic Programming), is an extension of classical Genetic Programming algorithm to support the robot control system evolution. To test the DGP's performance a simulation experiment, with the collision-free navigation task, was accomplished and its results are presented.

INDEX TERMS**Primary Classification:****I.** [Computing Methodologies](#) **I.2** [ARTIFICIAL INTELLIGENCE](#) **I.2.8** [Problem Solving, Control Methods, and Search](#) **Subjects:** [Heuristic methods](#)**Additional Classification:****I.** [Computing Methodologies](#) **I.2** [ARTIFICIAL INTELLIGENCE](#) **I.2.8** [Problem Solving, Control Methods, and Search](#) **Subjects:** [Control theory](#) **I.2.9** [Robotics](#)

J. [Computer Applications](#)**↪ J.7 [COMPUTERS IN OTHER SYSTEMS](#)****↪ Subjects:** [Command and control](#)**General Terms:**[Algorithms](#), [Design](#), [Management](#), [Theory](#)**Keywords:**[embodied evolution](#), [mobile robots](#), [genetic programming](#)**↑ Collaborative Colleagues:**Anderson Luiz Fernandes Perez: [colleagues](#)Guilherme Bittencourt: [colleagues](#)Mauro Roisenberg: [colleagues](#)

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