EDUARDO IZQUIERDO, PhD
Curriculum Vitae

Personal and contact details

Date of birth: May 8th, 1979
Place of birth: Venezuela
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Research interest

Dynamical systems analysis of artificially evolved, situated, and embodied agents to help understand behavior in biological systems, focusing on the interaction between the agent's internal neural dynamics, its body and its environment.

Education

Sept. 2004 – November 2008
D.Phil., Centre for Computational Neuroscience and Robotics.
Advisor: Dr. Inman Harvey. University of Sussex, Brighton, U.K.

Sept. 2003 – Sept. 2004
Title: M.Sc. Intelligent Systems (graduated with distinction).
Advisor: Dr. Inman Harvey. University of Sussex, Brighton, U.K.

Sept. 1997- Sept. 2002
Title: Computer Engineer (graduated with honours).
GPA: 4.1/5; Place in graduation: 6th/29; Universidad Simon Bolivar. Caracas, Venezuela.

Research and Teaching experience

Jan 2008 – Dec 2008
Research fellow at the Centre for Systems Biology in the University of Birmingham.

2004 – 2007
Teacher assistant for the *Artificial Life* course as part of the Master in Science Programme in Evolutionary and Adaptive Systems (EASy) at the University of Sussex.
Teacher assistant for the *Non-Symbolic Artificial Intelligence* second year undergraduate course at the University of Sussex.
Teacher assistant for the *Foundations of Computation* first year undergraduate course at the University of Sussex.
Voluntary teaching in the 'Homework Club': helping children from minorities and their parents cope with homework assignments, as part of a UNICEF program.

Sept 2002 – Sept 2003
Institute of Applied Computing, Univ. del Zulia. Maracaibo, Venezuela.
Title: Research Engineer. Area: Computational Biology and Biomedical Informatics.

July 2003
Assistant lecturer in the Introductory Course to Bioinformatics as part of the Genetics of Common Heritable Disorders Research Training Program in Venezuela.

July 2001 – June 2002
Center of Statistics and Mathematical Software, Univ. Simon Bolivar. Caracas, Venezuela.
Title: Assistant Researcher. Area: Simulation of agent-based economic models.

Awards and distinctions

2004-2007
Overseas Research Student Award Scheme (ORSAS). United Kingdom Scholarship for International Researcher Students of Outstanding Merit and Research Potential.

Graduate Teaching Assistantship. Dept. of Informatics and Dept. of Biological Sciences, University of Sussex.

2003-2004
Alβan: European Union Programme of High Level Scholarships for MSc studies at Univ. of Sussex.

Master's dissertation received distinction from University of Sussex, U.K.

1997-2002
Undergraduate dissertation received honorary distinction from Univ. Simon Bolivar, Venezuela.

Refereed publications

Izquierdo, E., Harvey, I. and Beer, R.D. (2008) Associative learning on a continuum in evolved dynamical neural networks. Journal of Adaptive Behavior. Adaptive Behavior 16, 361-384

Izquierdo, E. and Buhrmann, T. (2008) Analysis of a dynamical recurrent neural network evolved for two qualitatively different tasks: Walking and chemotaxis. In S. Bullock, J. Noble, R. A. Watson, and M. A. Bedau (Eds.) *Proc. of the 11th Int. Conf. on Artificial Life*. MIT Press, Cambridge, MA.
Winner of the best student paper award.

Izquierdo, E. and Fernando, C. (2008) The evolution of evolvability in gene transcription networks. In S. Bullock, J. Noble, R. A. Watson, and M. A. Bedau (Eds.) In S. Bullock, J. Noble, R. A. Watson, and M. A. Bedau (Eds.) *Proc. of the 11th Int. Conf. on Artificial Life*. MIT Press, Cambridge, MA.

Izquierdo, E. and Harvey, I. (2007) The dynamics of associative learning in an evolved situated agent. In Proc. of the 9th *European Conference on Artificial Life*. Springer-Verlag.

Izquierdo, E. and Harvey, I. (2007) Hebbian learning using fixed weight evolved dynamical 'neural' networks. In H.A. Abbass et al (Eds.) Proc. of the *First IEEE Symposium on Artificial Life*. pp394-401. IEEE Press.

Izquierdo, E. And Almeida e Costa, F. (2006) Special Issue on the dynamical systems approach to cognition. *Journal of Adaptive Behavior* 14(2).

Izquierdo, E. and Harvey, I. (2006) Learning on a continuum in evolved dynamical node networks. In Proc. of the *Tenth Int. Conf. on the Simulation and Synthesis of Living Systems*. pp507-512. MIT Press.

Izquierdo-Torres, E. and Di Paolo, E. (2005) Is an embodied system ever purely reactive? In Proc. of the *8th European Conference on Artificial Life*. LNAI 3630. pp.252-261. Springer-Verlag.

Izquierdo-Torres, E. (2004) The role of nearly neutral networks in the evolution of dynamical neural networks. In Proc. of the *9th Int. Conf. on the Simulation and Synthesis of Living Systems*. pp.322-327. MIT Press.

Other work

Izquierdo, E., and Harvey, I. (2006). A situated, embodied and dynamical systems approach to understanding learning and memory. Two page abstract for the *50th Anniversary Summit of Artificial Intelligence*. Switzerland, 9-14 July, 2006.

Izquierdo, E. and Harvey, I. (2005) Learning to discriminate between multiple possible environments: an imprinting scenario. In Workshop on *Memory and Learning Mechanisms in Autonomous Robotics* (ECAL 2005). Canterbury, UK.

Invited talks and conference presentations

"*Evolutionary robotics as a tool for studying learning behaviour*". Presented at the Bernstein Centre for Computational Neuroscience and Max Planck Institute in Goettingen, Germany. April 8th, 2008.

"*The Dynamics of Associative Learning in a Situated Agent*". Presented to ECAL 2007, Lisbon, Portugal. Sept. 11th, 2007.

"*Hebbian learning using fixed weight evolved dynamical neural networks".* Presented to First IEEE Symposium on Artificial Life, Honululu, Hawaii, US. March 4th, 2007.

"*Artificial evolution of learning behavior: an embodied, situated and dynamical systems approach"*. Cognitive Science Program Colloquia, Bloomington, Indiana University, US. Feb. 13th, 2006.

"*Learning on a continuum in evolved dynamical node networks: an imprinting scenario"*. Presented to Artificial Life seminar at the University of Sussex, UK. Nov. 9th, 2005.

"*Are embodied and situtated systems ever just reactive?"* Presented to European Conference on Artificial Life 2005, Canterbury, UK. Sept. 9th, 2005.

"*Explorations in homeostatic adaptation"*. Presented at the Dynamical Systems approach to Life and Cognition workshop at the University of Sussex, UK. March. 9th, 2005.

"*The role of nearly neutral networks in the evolution of dynamical neural networks"*. Presented at the International Conference on Artificial Life in Boston, US. Sept. 14th, 2004.

Organisation of scientific meetings

Co-organising the upcoming *Dynamics of Learning Behaviour and Neuromodulation* Workshop as part of the European Conference on Artificial Life in September 2007.

Co-organiser of the workshop *Active Agents and their Environments as Dynamical Systems* held during ECAL 2005 in the University of Kent, in September 2005.

Co-organiser of the workshop *Dynamical Systems approach to Life and Cognition* with the visit of Dr. Randall Beer to the University of Sussex, 8-9 March 2005.

Co-organier of the *Life and Mind seminar group* as part of the Centre for Computational Neuroscience and Robotics in the University of Sussex.

Co-founder or co-organiser of the *activate.d reading group*, in the University of Sussex.

Other academic activities

Assisting in the mentoring of a M.Sc. student's final project: *Dynamics of small recurrent neural networks with non-monotonic activation functions*.

Invited to be part of the Programme Committee for the *European Conference on Artificial Life 2007.*

Invited to review papers for the *Journal of Adaptive Behavior*, 2007.

Invited to be a commentator on the *Dynamics of Development* workshop to be held in Portugal, Sept. 2007.

Participant in the 3rd European Neuro-IT and Neuroengineering School (Neuroengineering of Cognitive Functions) held in Venice, June 2005.

Languages

Fluent in English. Native Spanish.

References

Inman Harvey
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Ezequiel A. Di Paolo
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Webpage: http://www.informatics.sussex.ac.uk/users/ezequiel/

Randall D. Beer
Professor in the Cognitive Science Program, Indiana University, US.
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