# Ezequiel A. Di Paolo

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## Profile

I am a cognitive scientist working at the intersection between the sciences of the mind and the humanities. I am a Research Professor in the Department of Logic and Philosophy of Science, University of the Basque Country. I work in cognitive science, philosophy of mind, and complex systems modelling. Previously I was a Reader in Evolutionary and Adaptive Systems at the University of Sussex where I have been co-director of the Evolutionary and Adaptive Systems MSc programme. My research interests include social cognition, embodiment, dynamical systems, biological modelling, and evolutionary robotics. I have extensive experience in research project management, teaching and research supervision (to date: 12 PhDs and 11 Postdocs). I am the author of over 125 peer-reviewed publications and Editor-in-Chief of the journal *Adaptive Behavior*.

## Personal Details

Born on 3rd March, 1970

Nationality: Argentinian / Italian.

## Employment

| | | |
|---|---|---|
| Research Professor<br>Philosophy, Cognitive Science | Ikerbasque, Basque Foundation for Science | 2010– |
| Reader<br>Evolutionary and Adaptive Systems | University of Sussex | 2007–2009 |
| Senior Lecturer<br>Evolutionary and Adaptive Systems | University of Sussex | 2005–2007 |
| Lecturer<br>Evolutionary and Adaptive Systems | University of Sussex | 2000–2005 |
| Postdoctoral Researcher | GMD: German National Research Center for Information Technology | 1999–2000 |

## Education

| | | |
|---|---|---|
| D.Phil., Computer Science and Artificial Intelligence | University of Sussex | 1995–1998 |
| M.Sc. Nuclear Engineering | Instituto Balseiro, Argentina | 1990–1994 |
| Physics & Mathematics | Universidad de Buenos Aires | 1988–1990 |

**Research Funding**

• *Quantifiable Constituents of Spiritual Growth* 2013–2016
John Templeton Foundation, $2,300,000
Co-investigator. Status: running.

• *eSMCs: Extending sensorimotor contingencies to cognition* 2011–2014
FP7-ICT-2009-6 no: 270212. €3,645,000
PI. Status: running.

• *TESIS: Towards an embodied science of intersubjectivity* 2011–2015
Marie-Curie ITN. FP7-PEOPLE-2010-ITN, no: 264828. €4,295,272.
PI and Network Training Coordinator. Status: running.

• *Basque Government Financing for Research Groups IAS-Research* 2013–2018
IT590-13. €226,598
Co-Investigator. Status: running.

• *Autonomy and levels of organization* 2012–2014
Spanish Ministry of Science and Innovation. FFI2011-25665/FISO. €70,950
Co-Investigator. Status: running.

• *Basque Government Financing for Research Groups IAS-Research* 2010–2012
IT505-10. €61,000.
Co-Investigator. Status: completed.

• *Information, autonomy and systems* 2005–2008
Spanish Ministry of Science and Education. HUM2005-02449. €45,220
Co-Investigator. Status: completed.

• *SECSE: Spatially-embedded Complex Systems Engineering* 2005–2009
EPSRC(UK) Project EP/C51632X/1. £1,534,784
PI. Status: completed.

• *SMoCN: Simple Models of Complex Networks* 2003–2004
EPSRC(UK) Research Cluster. GR/S63762/01. £53,539
PI. Status: completed.

• *Adaptation to radical sensorimotor disruptions through internal homeostasis* 2001–2003
Nuffield Foundation. NAL/00274/G. £4,000
PI. Status: completed.

**Awards and Fellowships**

| | |
|---|---|
| Cesar Milstein Award, Programa Raices (Argentina) | 2013 |
| Cesar Milstein Award, Programa Raices (Argentina) | 2009 |
| Nuffield Foundation Award for Newly Appointed Lecturers in Maths and Engineering | 2001–2003 |
| Overseas Research Students Award (CVCP, UK) | 1997–1998 |
| CONICET (Fellowship, Argentine National Research Council for Science and Technology) | 1995–1998 |
| Research Award from Argentine Ministry of Education | 1995–1997 |
| National Atomic Energy Agency Research Fellow (Argentina) | 1994–1995 |
| National Atomic Energy Agency Scholarship (Argentina) | 1990–1994 |

## Current Research

**Centre for Research on Life, Mind and Society** — University of the Basque Country — 2010–

- *Embodied cognitive science; Enactivism*
- *Social Cognition; Intersubjectivity*
- *Philosophy of Biology*

**Centre for Computational Neuroscience and Robotics** — University of Sussex — 2000–

- *Evolutionary robotics*
- *Computational neuroscience*
- *Evolutionary biology*
- *Philosophy of mind and embodied cognitive science*
- *Complex spatial networks*

## Previous Research Experience

**Postdoctoral Researcher** — German National Research Centre for Information Technology (GMD) — 1999–2000

- *Evolutionary biology modelling.*
- *Active perception and plasticity.*

**Doctoral Dissertation** — University of Sussex — 1995–1999
*"On the Evolutionary and Behavioral Dynamics of Social Coordination"*

Supervisor: Prof. Phil Husbands. Defended January 1999

**Research Fellow**, National Atomic Energy Agency — Department of Process Control. Bariloche Atomic Centre — 1994–1995

- *Recurrent neural networks for dynamic data analysis*

**MSc Dissertation**
*"A Knowledge-Based System for Real-Time Fault Diagnosis in a Nuclear Power Plant"*

Supervisor: Dr. Luis Rovere, Instituto Balseiro. Defended August 1994

## Media and Outreach

| | | |
|---|---|---|
| AVANT (Journal) | Interview (with Hanne De Jaegher) | 10/2012 |
| Noticias de Gipuzkoa | Interview (with Hanne De Jaegher) | 05/2012 |
| Gara newspaper | Interview (with Hanne De Jaegher) | 05/2012 |
| donostiakultura | Open public talk ("Body and Emotions") | 11/2011 |
| Ikerbasque Bulletin | Interview | 10/2011 |
| El Pais | Interview | 09/2011 |
| New APPS Blog | Interview | 06/2011 |
| RTVE (Spanish TV) | Tres14 (Pop Science Program) | 04/2011 |
| El Periodico de Aragon | Interview | 05/2010 |
| El Heraldo de Aragon | Interview | 05/2010 |
| Pagina 12 | Feature article | 05/2009 |

**Teaching/Supervision**

| | | |
|---|---|---|
| **Reader** | Evolutionary and Adaptive Systems<br>School of Cognitive and Computing<br>Sciences (COGS) University of Sussex | 2007–2009 |
| **Senior Lecturer** | | 2005–2007 |
| **Lecturer** | | 2000–2005 |

**Areas of teaching expertise:** Curriculum development, lecturing, seminar and lab class organisation, and assessment. Cognitive science, social cognition, artificial intelligence, adaptive systems, adaptive behaviour, ecological and evolutionary modelling, evolutionary game theory, spatially embedded processes, computational neuroscience, chronobiology, artificial life, scientific computing and numerical methods, pure and applied mathematics, dynamical systems theory, control theory, physics of nonlinear phenomena and self-organisation, philosophy of mind.

**Students:** Postgraduate level, including MSc, MRes and MA students in Evolutionary and Adaptive Systems, Philosophy of Cognitive Science, and Intelligent Systems. Undergraduate level: final year.

**Courses:**

• *Intelligence in Animals and Machines:* Postgraduate seminar organisation, development of course material and online resources, assessment.

• *Adaptive Systems:* Curriculum development, lectures, seminar organisation, development of course material and electronic resources, development of laboratory practices, assessment.

• *Dynamics of Development:* Newly developed postgraduate module (2006). Lectures, seminar organisation, development of course material and electronic resources, development of curriculum, assessment.

**Supervision:**

• *Postdoctoral supervision:* Since 2005: 11 researchers.

• *PhD supervision:* Since 2000: 12 completed dissertations.

• *MSc dissertation supervision:* 6-8 per year, 2000–2009. Supervised dissertations have won best dissertation prize in all years so far.

• *UG final-year project supervision:* 6-7 per year, 2000–2009. Supervised projects have obtained runner-up Searchspace prizes in 2002 and 2003 and won it in 2003, 2004 and 2005.

**Previous Teaching Experience**

| | | |
|---|---|---|
| **Tutor** | Instituto Balseiro | 1994–1995 |
| *Heat and Mass Transfer.* | | |
| **Tutor** | Instituto Balseiro | 1994–1995 |
| *Laboratory of Control Engineering.* | | |
| **Tutor** | Universidad de Buenos Aires | 1989–1990 |
| *Multi-variate Calculus* and *Linear Algebra.* | | |

**Event Organization**

- Summer School "Embodying Intersubjectivity Research", 14–18 May 2012, San Sebastian, Spain.
- Summer School "The Future of the Embodied Mind", 5–9 September 2011, San Sebastian, Spain.
- Workshop "Enactive Approaches to Social Cognition", 31 August – 1 September 2008, Battle, UK.
- Workshop "Agency in Artificial and Natural Systems", 11–12 July, 2008, Kyoto, Japan.
- Workshop "Mathematical Models in Evolution and Ecology", September, 20–21 2007, University of Sussex.
- "International Research Symposium: A Networks Perspective on Complex Systems Challenges", January, 19–20 2004, University of Leeds.
- "Summer Workshop on Simple Models of Complex Networks", July 17–18 2003, University of Leeds.
- Workshop "Open Challenges in Complex Networks Science", May 4, 2003, University of Leeds.
- Workshop "The View from Elsewhere" at the 6th European Conference on Artificial Life, (ECAL'2001), Prague, Czech Republic, Sept. 2001.
- Workshop "Artificial Life: Discipline or Method?" at the 5th European Conference on Artificial Life, (ECAL'99), Lausanne, Switzerland, Sept. 1999.

**Administrative**

- Project and Research Group Management (Embodiment and Intersubjectivity).
- Training Coordinator Marie-Curie Initial Training Network TESIS 2011– present.
- Editor in Chief of Adaptive Behavior: 2008– present.
- Co-Director Evolutionary and Adaptive Systems MSc Programme: 2008–2009.
- Member of CSAI Exam Board: 2001 - present.
- European Convenor, Informatics, Sussex University. 2001–2002
- Autonomous Robots Lab development and administration: 2001–2009.
- Organizer of the Life and Mind seminar series: 2006–present
- Co-organizer of Artificial Life Reading Group at Sussex (Alergic) seminar series: 2001–2009
- Erasmus Programme: Sussex Coordinator for Seminar in Cognitive Science: 2001–2009.
- Liaison Erasmus Programme Intesif Philosophie, Technologie, Cognition: 2001–2009.

**Professional Memberships**

- Member of the EPSRC College of Peers (2006–present).
- Member of the Board of Directors of the *International Society of Artificial Life - ISAL* (2009–present).
- Member of the *International Society for Adaptive Behavior - ISAB* (2008–present).

**Other Professional Activities**

- Keynote speaker at several international conferences and workshops.
- Editor-in-chief of the journal *Adaptive Behavior* (2008–present).
- Member of the Editorial Board of *Constructivist Foundations* and *Leonardo Electronic Almanac* (2009–present).
- External examiner, Computing and AI Masters Programme, University of Plymouth.
- Expert reviewer FP7-ICT.
- Grant proposal reviewer for the European Commission, EPSRC(UK), ESRC(UK), Swiss National Science Foundation, Research Foundation Flanders (FWO), and others.
- Project progress reviewer for EU-FP6 projects.
- Guest Editor for special issue of *Phenomenology and the Cognitive Science* on "The Social and Enactive Mind". Issue 8(4), 2009.
- Guest Editor for special issue of *Adaptive Behavior* on "Plastic mechanisms, multiple timescales and lifetime adaptation". Issue 10(3/4), 2002.
- Guest Editor for special issue of *Artificial Life* on "Francisco Varela and Alife" Issue 10/3, 2004.
- Regular member of the Programme Committee of major international conferences in the field (ECAL, CEC, SAB, ALife, GECCO).
- Programme Committee Membership 2004/5: SBRN 2004: Brazilian Symposium on Artificial Neural Networks (SBRN) São Luis, Brazil, 2004; IMAACA 2004. I3M: Genoa, Italy, 2004; AMIRE 2005: International Symposium on Autonomous Miniature Robots. Fukui, Japan 2005; IWASP: International Workshop on Self-Adaptive Systems and Processes. Taipei, 2005; Bio-ADIT 2006: 2nd International Workshop on Biologically Inspired approaches to Advanced Information Technology. Osaka University, 2006;
- Reviewing activity for *Frontiers in Neuroscience*, *Journal of Consciousness Studies*, *Phenomenology and the Cognitive Sciences*, *Adaptive Behavior*, *Animal Behaviour*, *Artificial Life*, *BioSystems*, *Body and Society*, *Cognitive Science*, *Cybernetics and Systems*, *IEEE Transactions on Evolutionary Computation*, *Philosophical Transactions of the Royal Society, London A*, *Physica D*, and others.
- Internal and external examiner of several (15+) PhD defences at international level. Member of jury for a defence for a Habilitation à Diriger des Recherches (Université Blaise Pascal, France, 2006).

# Ezequiel A. Di Paolo – List of Publications

September, 2013
http://ezequieldipaolo.wordpress.com/publications/

**Citation Information**

Citations: 2963

h-index: 27

i10-index: 59

Source: Google Scholar (5-09-2013)

**Journal Papers, Refereed**

[1] Buhrmann, T., and Di Paolo, E. A. (submitted). Spinal circuits accommodate internal loads during multijoint limb movements, *The Journal of Neuroscience*.

[2] Kyselo, M., and Di Paolo, E. A. (submitted). Locked-in Syndrome: A challenge for embodied cognitive science, *Phenomenology and the Cognitive Sciences*.

[3] Di Paolo, E. A., De Jaegher, H. and Gallagher, S. (2013). One step forward, two steps back. Not the tango. *Trends in Cognitive Sciences*, 17(7): 303–304, doi: 10.1016/j.tics.2013.05.003.

[4] Buhrmann, T., Di Paolo, E. A. and Barandiarn, X. (2013) A dynamical systems account of sensorimotor contingencies, *Frontiers in Psychology* 4:285. doi: 10.3389/fpsyg.2013.00285.

[5] McGann, M., De Jaegher, H. and Di Paolo, E. A. (2013) Enaction and psychology, *Review of General Psychology*, 17(2), 203 209 doi: 10.1037/a0032935.

[6] De Jaegher H and Di Paolo E. A. (2013). Enactivism is not interactionism. *Frontiers in Human Neuroscience* 6:345.

[7] Bedia M. G. and Di Paolo E. A. (2012). Unreliable gut feelings can lead to correct decisions: The somatic marker hypothesis in non-linear decision chains. *Front. Psychology* 3:384.

[8] Di Paolo, E. A. and De Jaegher, H. (2012). The interactive brain hypothesis, *Frontiers in Human Neuroscience*, 6:163.

[9] Hu, X-B, Wang, M. and Di Paolo, E. A. (2012). Calculating complete and exact Pareto front for multiobjective optimization: A new deterministic approach for discrete problems, *IEEE Transactions on Systems, Man, and Cybernetics: Part B*, 99, doi: 10.1109/TSMCB.2012.2223756

[10] Egbert, M. D., Barandiaran, X. E., and Di Paolo, E. A. (2012). Behavioral metabolution: The adaptive and evolutionary potential of metabolism-based chemotaxis. *Artificial Life*, 18(1), 1-25.

[11] Froese, T. and Di Paolo, E. A. (2011). The enactive approach: Theoretical sketches from cell to society. *Pragmatics and Cognition*, 19, 1-36.

[12] Hu, X-B. Wang, M., Leeson, M. S, Hines, E. L., and Di Paolo, E. A. (2011). A deterministic ripple-spreading model for complex networks, *Physical Review E*, 83, 046123.

[13] Egbert, M., Barandiaran, X. and Di Paolo, E. A. (2010). A minimal model of metabolism-based chemotaxis, *PLoS Computational Biology*, 6(12): e1001004.

[14] Hu, X-B. and Di Paolo, E. A. (2010) A ripple-spreading genetic algorithm for the aircraft sequencing problem, *Evolutionary Computation*, 19(1): 77 – 106.

[15] De Jaegher, H., Di Paolo, E. A., and Gallagher, S. (2010). Can social interaction constitute social cognition? *Trends in Cognitive Sciences*, 14(10), 441 – 447.

[16] Husbands, P., Philippides, A., Vargas, P., Buckley, C. L., Fine, P., Di Paolo, E. A. and O'Shea (2010). Spatial, temporal and modulatory factors affecting GasNet evolvability, *Complexity*, 16(2): 35 – 44.

[17] Bullock, S., Barnett, L., Di Paolo, E. A. (2010). Spatial embedding and the structure of complex networks, *Complexity*, 16(2): 20 – 28.

[18] Di Paolo, E. A. (2010). Robotics inspired in the organism. *Intellectica*, 53-54: 129 – 162.

[19] Froese, T. and Di Paolo, E. A. (2010) Modeling social interaction as perceptual crossing: An investigation into the dynamics of the interaction process, *Connection Science*, 22(1): 43 – 68.

[20] Froese, T. and Di Paolo, E. A. (2009) Sociality and the lifemind continuity thesis, *Phenomenology and the Cognitive Sciences*, 8(4), 439 – 463

[21] Egbert, M., and Di Paolo, E. A. (2009). Adding behavior to autopoiesis: A foray in computational chemo-ethology. *Adaptive Behavior*, 17(5), 387 – 401.

[22] Barandian, X., Di Paolo, E. A., and Rohde, M. (2009). Defining agency. *Adaptive Behavior*, 17(5), 367 – 386.

[23] Di Paolo, E. A. (2009). Extended life *Topoi*, 28, 9 – 21.

[24] Hu, X-B., Di Paolo, E. A. (2009). An efficient genetic algorithm with uniform crossover for air traffic control, *Computers and Operations Research*, 36, 245 – 259.

[25] Vickerstaff, R., and Di Paolo, E. A. (2008). Regarding compass response functions for modeling path integration. *Adaptive Behavior*, 16(4), 275 – 276.

[26] Di Paolo, E. A. (2008). A mind of many. *Constructivist Foundations*, 3(2), 89 – 91.

[27] Hu, X-B., Di Paolo, E. A. (2008). A binary representation based genetic algorithm for aircraft arrival sequencing and scheduling, *IEEE Transactions on Intelligent Transportation Systems*, 9, 301 – 310.

[28] Hu, X-B., Di Paolo, E. A. and Wu S. F. (2008) A comprehensive fuzzy-rule-based self-adaptive genetic algorithm, *Journal of Intelligent Computing and Cybernetics*, 1, 94 – 109.

[29] Di Paolo, E. A. and Iizuka, H. (2008). How (not) to model autonomous behaviour, *BioSystems*, 91, 409 – 423.

[30] Di Paolo, E. A., Rohde, M. and Iizuka, H. (2008). Sensitivity to social contingency or stability of interaction? Modelling the dynamics of perceptual crossing. *New Ideas in Psychology* Special issue on Dynamics and Psychology, 26, 278 – 294.

[31] McDonald-Gibson, J., Di Paolo, E. A., Dyke, J. G. and Harvey, I. (2008). Environmental regulation can arise under minimal assumptions. *Journal of Theoretical Biology*, 251(4), 653 – 666.

[32] Barnett, L., Di Paolo, E. A., Bullock, S. (2007). Spatially embedded random networks *Physical Review E*, 76, 056115.

[33] De Jaegher, H. and Di Paolo, E. A. (2007). Participatory sense-making: An enactive approach to social cognition, *Phenomenology and the Cognitive Sciences*, 6(4), 485 – 507.

[34] Iizuka, H. and Di Paolo, E. A. (2007). Toward Spinozist robotics: Exploring the minimal dynamics of behavioural preference. *Adaptive Behavior*, 15(4), 359 – 376.

[35] Hu, X-B., Di Paolo, E. A., Chen, W-H. (2007). Multi-airport capacity management: Genetic algorithm with receding horizon. *IEEE Transactions on Intelligent Transportation Systems*, 8(2), 254 – 263.

[36] Di Paolo, E. A. (2005). Autopoiesis, adaptivity, teleology, agency. *Phenomenology and the Cognitive Sciences*, 4(4), 429 – 452.

[37] Macinnes, I. and Di Paolo, E. A. (2006). The advantages of evolving perceptual cues. *Adaptive Behavior* 14(2), 147 – 156.

[38] Silver, M., and Di Paolo, E. A. (2006). Spatial factors favour the evolution of niche construction. *Theoretical Population Biology*, 70(4), 387 – 400.

[39] Suzuki, M., Floreano, D., and Di Paolo, E. A. (2005). Constraints on body movement during visual development affect the behavior of evolutionary robots. *Neural Networks*, 18(5/6), 657 – 666.

[40] Vickerstaff, R., and Di Paolo, E. A. (2005). Building neural models of path integration. *Journal of Experimental Biology*, 208, 3349 – 3366.

[41] Di Paolo, E. A. (2004). Unbinding biological autonomy: Francisco Varela's contributions to artificial life. *Artificial Life*, 10/3, 231 – 234.

[42] Di Paolo, E. A., and Harvey, I. (2004). Decisions and noise: The scope of evolutionary synthesis and dynamical analysis. *Adaptive Behavior*, 11(4), 284 – 288.

[43] Harvey, I. Di Paolo, E. A., Tuci, E. and Wood, R. (2004). Evolutionary robotics: A new scientific tool for studying cognition. *Artificial Life*, 11(1/2), 79 – 98.

[44] Rohfshagen, P. and Di Paolo, E. A. (2004). The topological origin of rhythm in asynchronous random Boolean networks. *BioSystems*, 73, 141 – 152.

[45] Di Paolo, E. A. (2003) Evolving spike-timing dependent plasticity for single-trial learning in robots. *Philosophical Transactions of the Royal Society of London A*, 361, 2299 – 2319.

[46] Di Paolo, E. A. (2002). Plastic mechanisms, multiple timescales, and lifetime adaptation. *Adaptive Behavior*, 10(3/4), 141 – 142.

[47] Di Paolo, E. A. (2002) Spike timing dependent plasticity for evolved robots. *Adaptive Behavior*, 10(3/4), 243 – 263.

[48] Wheeler, M., Bullock, S., Di Paolo, E., Noble, J., Bedau, M., Husbands, P., Kirby, S. and Seth, A. (2002) The view from elsewhere: Perspectives on ALife modelling. *Artificial Life*, 8(2), 87 – 100.

[49] Di Paolo, E. A. (2001) Rhythmic and non-rhythmic attractors in asynchronous random Boolean networks. *BioSystems*, 59(3), 185 – 195.

[50] Di Paolo, E. A. (2000) Ecological symmetry breaking can favour the evolution of altruism in an action-response game. *Journal of Theoretical Biology*, 203, 135 – 152.

[51] Di Paolo, E. A. (2000) Behavioral coordination, structural congruence and entrainment in a simulation of acoustically coupled agents. *Adaptive Behavior*, 8(1), 25 – 46.

[52] Di Paolo, E. A. (1997) An investigation into the evolution of communication. *Adaptive Behavior*, 6, 285 – 324.

**Books**

[1] P. Vargas, E. A. Di Paolo, I. Harvey, and P. Husbands (Eds) *The horizons of evolutionary robotics*, MIT Press, in press.

[2] J. Stewart, O. Gapenne, and E. A. Di Paolo (Eds) *Enaction: Towards a new paradigm for cognitive science*, MIT Press, 2010.

**Book Chapters**

[1] Di Paolo, E. A. (forthcoming) "El enactivismo y la naturalización de la mente", in D. P. Chico and M. G. Bedia (eds) *Nueva ciencia cognitiva: Hacia una teoría integral de la mente*, Madrid: Plaza y Valdes Editores.

[2] Harvey, I. and Di Paolo, E. A., (forthcoming) "Evolutionary pathways", in P. Vargas, E. A. Di Paolo, I. Harvey and P. Husbands, *Horizons for Evolutionary Robotics*, MIT Press.

[3] Vaughan, E., Di Paolo, E. A., and Harvey, I., (forthcoming) "Incremental evolution of an omnidirectional biped for rugged terrain", in P. Vargas, E. A. Di Paolo, I. Harvey and P. Husbands, *Horizons for Evolutionary Robotics*, MIT Press.

[4] Wheeler, M. and Di Paolo, E. A. (2011). "Existentialism and cognitive science", in Reynolds, J., Woodward, A., and Joseph, F. (eds) *The Continuum Companion to Existentialism*, Continuum, pp. 241 – 259.

[5] Di Paolo, E. A., Rohde, M. and De Jaegher, H., (2010). "Horizons for the Enactive Mind: Values, Social Interaction, and Play". In J. Stewart, O. Gapenne and E. A. Di Paolo (eds), *Enaction: Towards a New Paradigm for Cognitive Science*, Cambridge, MA: MIT Press, pp. 33 – 87.

[6] Di Paolo, E. A. (2010). "Living Technology". In *Living Technology: 5 Questions*, Mark Bedau, Pelle Guldborg Hansen, Emily Parke, Steen Rasmussen (Eds), Automatic Press/VIP, pp. 67 – 76.

[7] Di Paolo, E. A. (2009). "Overcoming autopoiesis: a enactive detour on the way from life to society". In R. Magalhaes, and R. Sanchez (Eds) *Autopoiesis in Organizations and Information Systems*, Elsevier, pp. 43 – 68.

[8] Bird, J. and Di Paolo, E. A. (2008). "Gordon Pask and his maverick machines". In P. Husbands, O. Holland, and M. Wheeler (Eds) *The Mechanisation of Mind in History*, MIT Press, pp. 185 – 212.

[9] De Jaegher, H. and Di Paolo, E. A. (2008). "Making sense in participation: An enactive approach to social cognition". In F. Morganti, A. Carassa, and G. Riva (Eds) *Enacting intersubjectivity: A cognitive and social perspective to the study of interactions*, IOS Press: Amsterdam, pp. 33 – 48.

[10] Hu, X., and Di Paolo, E. A. (2008). "An efficient genetic algorithm with uniform crossover for the multi-objective airport gate assignment problem", in K. C. Tan, C. K. Goh and Y. S. Ong (eds) *Multi-Objective Memetic Algorithms*, Springer-Verlag, pp. 71 – 90.

[11] Hu, X., and Di Paolo, E. A. (2008). "Genetic algorithms for the airport gate assignment problem: Linkage, representation and uniform crossover", (invited chapter) in Y.P. Chen and M.H. Lim (eds) *Linkage in Evolutionary Computation*, Springer-Verlag, pp. 361 – 388.

[12] Di Paolo, E. A. (2004). "Organismically-inspired Robotics: Homeostatic adaptation and natural teleology beyond the closed sensorimotor loop", in K. Murase and T. Asakura (Eds) *Dynamical systems approach to embodiment and sociality*, Advanced Knowledge International, Adelaide, pp. 19 – 42.

[13] Noble, J., Di Paolo, E. A., and Bullock, S. (2001). "Adaptive factors in the evolution of signalling systems". In A. Cangelosi and D. Parisi (Eds) *Simulating the Evolution of Language*, Springer Verlag, London, pp. 53 – 78.

**Conference Papers, Refereed**

[1] Barandiaran, X. and Di Paolo, E. A. (2011) Modelling sensorimotor habits with neuro-robotics: A reappraisal of the habit concept in psychology, in ESCOP 2011, 17th Meeting of the European Society for Cognitive Psychology, Donostia, Spain, 29 Sept 2 Oct 2011.

[2] Kyselo, M. and Di Paolo, E. A. (2010) Through the Enactive Eye Locked-in Syndrome as a Challenge for Embodied Cognition, 10th Biannual Conference of the German Society for Cognitive Science, KogWis 2010, Postdam, October 3 - 6 , 2010.

[3] Egbert, M., Barandiaran, X and Di Paolo, E. A. (2010). Behavioral Metabolution: Metabolism based behavior enables new forms of adaptation and evolution Artificial Life XII, The 12th International Conference on the Synthesis and Simulation of Living Systems, 19-23 August, 2010, Odense, Denmark.

[4] Hu, X-B, Wang, M., Leeson, M. S., Hines, E. L. and Di Paolo, E. A. (2010) A Review on Ripple-Spreading Genetic Algorithms for Combinatorial Optimization Problems, In ICCI 2010, The 9th IEEE International Conference on Cognitive Informatics, July 7-9, 2010, Tsinghua University, Beijing, China.

[5] Barandiaran, X. and Di Paolo. E. A. (2010) Homeostatic plasticity in robots. 4th International Conference on Cognitive Systems. CogSys, 2010, ETH Zurich, Switzerland, Jan 27 – 28, 2010.

[6] Froese, T. and Di Paolo, E. A. (2009) Toward minimally social behavior: Social psychology meets evolutionary robotics, in Kampis, G., Karsai, I and Szathmary, E. (eds) Advances in Artificial Life Proceedings of the 10th European Conference on Artificial Life, ECAL09, Budapest, September 13-16, 2009, LNAI 5777, Springer Verlag, pp. 420 – 427.

[7] Manicka, S. and Di Paolo, E. A. (2009) Local ultrastability in a real system based on programmable springs in Kampis, G., Karsai, I and Szathmary, E. (eds) Advances in Artificial Life Proceedings of the 10th European Conference on Artificial Life, ECAL09, Budapest, September 13-16, 2009, LNAI 5777, Springer Verlag, pp. 87 – 94.

[8] Egbert, M., Di Paolo, E. A. and Barandiaran, X. (2009) Chemo-ethology of a adaptive protocell: Sensor-less sensitivity to implicit viability conditions in Kampis, G., Karsai, I and Szathmary, E. (eds) Advances in Artificial Life Proceedings of the 10th European Conference on Artificial Life, ECAL09, Budapest, September 13-16, 2009, LNAI 5777, Springer Verlag, pp. 242 – 249.

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**Invited Conference Presentations**

[1] Di Paolo, E. A., (2013). "Interactive time-travelling". TESIS 1st International Conference. Enactive and Phenomenological Approaches to Intersubjectivity, Copenhangen, Feb 6-8.

[2] Di Paolo, E. A., (2013). "The enactive body". Seminar From perceptual interaction to extended cognition Université de Technologie de Compiègne, Jan 22-25.

[3] Di Paolo, E. A., (2013). "Not one, not two (reloaded)". II ReteCog Workshop. Interaction. University of Zaragoza, Jan 17-19

[4] Di Paolo, E. A., (2012). "Agency, incorporation and non-individuals: Time and precariousness in networked individuality". Workshop on Autonomy and Individual Organisms in Biology, San Sebastián, Oct 27-28.

[5] Di Paolo, E. A., (2012). "The enactive body Where life, mind and society intersect", Mind and Life Summer Research Institute, Garrison Institute, Garrison, New York, June 16-22.

[6] Di Paolo, E. A., (2012). "Walking circles around a problem: The parallax epistemology of enactivism", Embodying intersubjectivity research TESIS summer school, San Sebastián, May 14-18.

[7] De Jaegher, H. and Di Paolo, E. A., (2011). "Participatory sense-making, Intersubjectivity from Birth for Life: A Celebration for Colwyn Trevarthen, University of Edinburgh, Oct 15, 2011.

[8] Di Paolo, E. A., (2011). "The Future of the Embodied Mind, Introductory talk at The Future of the Embodied Mind Summer School, 5-6 Sept. 2011, San Sebastián, Spain.

[9] Di Paolo, E. A., (2011). "What is the enactive body?, Collegium for Advanced Study of Picture Act and Embodiment, Berlin.

[10] Di Paolo, E. A., (2011). "The mind in-between: Can social interaction constitute social cognition?, The Whitehead lectures in Cognition, Computation and Culture, Goldsmiths College, London.

[11] Di Paolo, E. A., (2010). "The social invisible, Embodiment, Intersubjectivity and Psychopathology, International Conference, University of Heidelberg 30 Sept 2 Oct 2010.

[12] Di Paolo, E. A., (2010). "How the mind shapes the body Enaction School 2010, 27th June 3rd July 2010. Ballykisteen, Co. Tipperary, Ireland.

[13] Di Paolo, E. A., (2010). "Extended Life, First European Summer School on Life & Cognition, Miramar Palace, Donostia-San Sebastián, 22nd 26th June, 2010.

[14] Di Paolo, E. A., (2010). "Lo hemos resuelto pero no sabemos cómo, GIGA group seminar, University of Zaragoza, Spain, May 2010.

[15] Di Paolo, E. A., (2010). "El rol del cuerpo en el estudio de la mente, Conferencias iberCaja, Zaragoza, Spain, May 2010.

[16] Di Paolo, E. A., (2010). "El enfoque enactivo en ciencias cognitivas, Centro Cultural iberCaja, Huesca, Spain, May 2010.

[17] Di Paolo, E. A., (2010). "The mind in-between: Can social interaction constitute social cognition?, COGS Seminar, University of Sussex, Feb, 2010.

[18] Di Paolo, E. A., and De Jaegher, H. (2010). "Does social interaction constitute social cognition?" Conference on Dynamic models of social interaction, University of Aarhus, Jan 2010.

[19] Di Paolo, E. A., (2009). "From sensorimotor coordination to enaction: Agency, sense-making and sociality as horizons for embodied cognition", Keynote lecture, EUCogII Members Conference Oct. 10-11 2009, Hamburg.

[20] Di Paolo, E. A., (2009). "Enactive perception: Beyond the sensorimotor approach", Philosophy of Perception Conference, University of Tokyo, Japan, March 5-7th, 2009.

[21] De Jaegher, H. and Di Paolo, E. A., (2009) "Implications of the enactive definition of the social", Workshop on Enacting Intersubjectivity, Lugano, Switzerland, February 13-14th, 2009.

[22] Di Paolo, E. A., (2008) "Agency and time", Agency Workshop, Kyoto, Japan, July 17th, 2008.

[23] Di Paolo, E. A., (2007) "Escape from pervasive individualism: Why should embodied cognition seriously study the collective dynamics of social interaction?" 9th European Conference on Artificial Life, ECAL2007, September 10–14, 2007, Lisbon, Portugal. Keynote Speaker.

[24] Di Paolo, E. A., (2007) "Groovedigging: an Ashbyan Principle for the Dynamics of Development". Workshop on Dynamical Approaches to Development: Beyond the Metaphor. 9th European Conference on Artificial Life, ECAL2007, September 9 –10, 2007, Lisbon, Portugal.

[25] Di Paolo, E. A., (2007) "Enaction begins in autonomy". CNRS Summer School: Enaction and Cognitive Science. Organized by the Association pour la Recherche Cognitive (ARCo), 6 September to 12 September 2007 – Fréjus, France.

[26] Di Paolo, E. A., (2006) "Enactive sense-making, play and the receding horizon of representationalism". Workshop on Representation and action in human beings and machines. Università degli Studi di Siena, Siena, Italy, 20 – 22 October 2006.

[27] Di Paolo, E. A., (2006) "Sense-making and agency: Being and doing intertwined". SAB06 Workshop: Behaviour and Mind as a Complex Adaptive System. Roma, Italy, 30 Sept. 2006.

[28] Di Paolo, E. A., (2006) "Enactive perception: Lessons from evolutionary robotics". Perceiving and Being Perceived in Digital Environments, Cognitive Technologies Program (FMSH – EDF R&D). Paris, 12 June 2006.

[29] Di Paolo, E. A., (2006) "Horizons for the enactive mind: Values, social interacion, and play". CNRS Summer School: Constructivism and Enaction: A New Paradigm for Cognitive Science. Organized by the Association pour la Recherche Cognitive (ARCo) 29 May to 03 June 2006 - Ile d'Oléron, France.

[30] Di Paolo, E. A., (2006) "Playing to be mindful (remedies for chronic boxology)". AISB'06 Symposium on Machine Consciousness. University of Bristol.

[31] Di Paolo, E. A., (2006) "Challenges for artificial cognitive systems". Artificial Cognitive Systems – Models and Paradigms. A preparatory Workshop for the EU Seventh Framework Programme (FP7) 2007-2013 for research and technology development. Luxembourg, 20-21 March 2006.

[32] Di Paolo, E. A., (2006) "Autopoiesis, Adaptivity, and Sense-making: towards a biology of values". NUCOG/PHITECO Seminar Cognition, Motivation, Action. Université de Technologie de Compiègne.

[33] Di Paolo, E. A., Bullock, S. and Noble, J. (2005) "The role of the individual in individual-based models". British Ecological Society Annual Meeting 5 – 7 September 2005. University of Hertfordshire.

[34] Di Paolo, E. A., (2004) Beyond robot movement, towards robot action. Erasmus Seminar *Savoir ce que l'on fait*. Universitè de Technologie de Compiégne.

[35] Di Paolo, E. A., (2003) Evolutionary robotics: the Sussex approach. *Art+Science Symposium.* Universidad del Pais Vasco, Bilbao.

[36] Di Paolo, E. A.,(2003) Plastic and non-plastic spiking neural controllers in evolutionary robotics. *Second International Conference on Computation and Control in Spiking Neuronal Networks.*, University of Sussex.

[37] Di Paolo, E. A.,(2003) Homeostasis in adaptive behaviour, neuroscienc and evolutionary robotics. *Third Daisyworld and Beyond Workshop.*, University of Sussex.

[38] Di Paolo, E. A.,(2002) Towards organismically-inspired robotics. In Dynamic Systems Approach to Embodiment and Sociality, 3rd International Symposium on Human and Artificial Intelligence, HART 2002, University of Fukui, Japan. Keynote Speaker.

[39] Di Paolo, E. A.,(2003) Evolutionary synthesis of networks. *Simple Models of Complex Networks Workshop.*, University of Leeds.

[40] Di Paolo, E. A.,(2003) Organismically-inspired robotics: homeostatic adaptation and teleology beyond the closed sensorimotor loop. Erasmus Seminar *Espaces d'action, espaces de perception*. Universitè de Technologie de Compiégne.

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**Edited Special Issues**

[1] Di Paolo, E. A., (2009). The Social and Enactive Mind, *Phenomenology and the Cognitive Sciences*, Special Issue, vol 8 issue 4.

[2] Di Paolo, E. A., (2004). Francisco Varela's contributions to ALife. *Artificial Life* Special issue, vol 10/3.

[3] Di Paolo, E. A., (2002). Plastic Mechanisms, Multiple Timescales and Lifetime Adaptation, *Adaptive Behavior* Special Issue vols 10(3/4) and 11(1).

**Reviews and Commentaries**

[1] Todd, P., and Di Paolo, E. A. (2009) Farewell and hello editorial *Adaptive Behavior*, 17(1), 5 – 6.

[2] Di Paolo, E. A. (2007) Secreting mind out of matter. AI Lab (ed.) *The Rediscovery of Intelligence: 20 Years of AI - in Zurich and world-wide.*

[3] Di Paolo, E. A., (2007). The Quiet Heideggerian. Review of Michael Wheeler's Reconstructing the cognitive world, MIT Press. *Artificial Life*, 13(1), 203 –206.

[4] Di Paolo, E. A., (2004). Hans Jonas' The Phenomenon of Life *Journal of the British Society for Phenomenology*, 36(3), 340 – 342..

[5] Di Paolo, E. A., (2002). Review of "Cycles of Contingency" edited by S. Oyama, R. Gray and P. Griffiths, MIT Press. *Artificial Life*, 8(2), 219 – 222.

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[7] Di Paolo, E. A., (2001). Review of "The Mechanization of the Mind: On the Origins of Cognitive Science" by J-P. Dupuy. *Cognitive Systems Research*, 2, 291 – 295.

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