

Giovanni Pezzulo

Curriculum Vitae

Institute of Cognitive Sciences and Technologies
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I am a **researcher at the National Research Council of Italy**, Institute of Cognitive Sciences and Technologies, Rome. Italy. I got a **degree in Philosophy of Science** (University of Pisa) and a **PhD in Cognitive Psychology** (University of Rome, "La Sapienza").

I study **cognitive science from an interdisciplinary perspective** that combines experimental studies with computational modeling and cognitive robotics. My primary research areas are: **computational neuroscience** and **cognitive / experimental psychology**.

Short facts

- I was born in Chieti (Italy) on the 10th of February, 1974. My nationality is: Italian
- I have published more than 150 papers in peer-reviewed international journals and conferences. My publications can be found in [Google Scholar](#), [ORCID](#), or [my webpage](#).
- Scholar h-index: 34 (3860 Citations on May 1st, 2017); Scopus h-index: 21
- Email: giovanni.pezzulo@istc.cnr.it
- Phone: +39 06 4459 5206; Fax: +39 06 4459 5243
- Personal homepage: sites.google.com/site/giovannipezzulo/

Main research topics and key scientific advancements

My research focuses mainly on the following topics: 1) goal-directed decision-making, 2) social interaction and joint action, 3) the grounding of higher cognition in sensorimotor prediction, and 4) probabilistic models of brain and cognition.

1. Goal-directed decision-making and planning

I study how humans and other animals make decisions and plan, especially in complex and ecologically valid situations full of action choices. To this aim, I perform experiments on human and animal decision-making and I build computational models within the framework of probabilistic (Bayesian) inference. I developed novel theories of goal-directed choice and planning that emphasize the roles of prediction and internal models (aka model-based control and active inference) and the interplay of decision and action dynamics during situated decisions (aka embodied choice). Key publications:

- **Pezzulo, G.**, Cisek, P. (2016) Navigating the Affordance Landscape: Feedback Control as a Process Model of Behavior and Cognition. *Trends in Cognitive Sciences*, 20(6), 414-424
- **Pezzulo, G.**, van der Meer, M., Lansink, C., Pennartz, C. (2014) Internally generated sequences in learning and executing goal-directed behavior. *Trends in Cognitive Sciences*, 18(12), 647-657
- Verschure, P., Pennartz, C., **Pezzulo, G.** (2014) The why, what, where, when and how of goal directed choice: neuronal and computational principles. *Philosophical Transaction of the Royal Society of London: Series B, Biological Sciences*, 369:20130483.

Other key results on this topic:

- In 2014 I obtained a **Human Frontiers Science Program grant** to study the computational and neuronal mechanisms for complex spatial choices (RGY0088/2014), in collaboration with Matt van der Meer (Dartmouth, USA) and Caleb Kemere (Rice, USA). The grant is still active.
- From 2011 to 2014 I was **Project Coordinator** of the project Goal-Leaders (Goal-directed, Adaptive Builder Robots), funded by the EU's 7th Framework Programme (FP7-ICT-STRP-270108), to study goal-directed choice from combined biological and robotic perspectives.
- In 2014 **guest-edited a special issue** on "The principles of goal-directed decision-making" in the high-impact journal: Philosophical Transactions of the Royal Society B: Biological Sciences

2. Social interaction and joint action

I study how human co-actors coordinate their actions in space and time to achieve joint goals, such as building something together or performing team sports. To this aim, I perform experiments on human-human joint action and I build computational models within the framework of probabilistic (Bayesian) inference. I developed novel theories of joint action that emphasize mutual prediction and the exchange of coordination signals (aka sensorimotor communication). Key publications:

- **Pezzulo, G.**, Iodice, P., Donnarumma, F., Dindo, H., Knoblich, G. (2017). Avoiding accidents at the champagne reception: A study of joint lifting and balancing. *Psychological Science*, in press
- Candidi, M., Curioni, A., Donnarumma, F., Sacheli, L. M., **Pezzulo, G.** (2015) Interactional leader-follower sensorimotor communication strategies during repetitive joint actions. *Journal of the Royal Society Interface*, 12(110), 20150644
- **Pezzulo, G.**, Donnarumma, F., and Dindo, H. (2013) Human sensorimotor communication: A theory of signaling in online social interactions. *PLoS ONE*, 8(11):e79876.

Other key results on this topic:

- From 2009 to 2013 I was **Team Leader** (for the CNR unit) of the of the project HUMANOBS (Humanoids that learn socio-communicative skills through observation), funded by the EU's 7th Framework Programme (FP7-ICT-STRP-231453) to study joint action in humans and robots.

3. The grounding of higher cognition in sensorimotor prediction

I study the ways human higher cognitive abilities, and especially future oriented abilities such as prospection and imagination, stem from (and are grounded in) sensorimotor skills. In keeping with embodied theories of cognition, I start from the hypothesis that the architecture of motor prediction and control of our earlier evolutionary ancestors was gradually improved to afford prospective functions and cognitive control – and the latter (higher cognitive) abilities retain essential elements of sensorimotor, predictive control. To test this hypothesis, I perform human experiments and build computational models, within the framework of probabilistic (Bayesian) inference. Key publications:

- **Pezzulo, G.**, Kemere, C., and van der Meer, M. (2017) Internally generated hippocampal sequences as a vantage point to probe future-oriented cognition. *Annals of the New York Academy of Sciences*, in press.
- **Pezzulo, G.**, Rigoli, F., Friston, K. (2015) Active inference, homeostatic regulation and adaptive behavioural control. *Progress in Neurobiology*, 134:17–35.
- Lepora, N. F., **Pezzulo, G.** (2015) Embodied choice: how action influences perceptual decision making. *PLoS Computational Biology*, 11(4):e1004110, 2015.

4. Probabilistic models of brain and cognition

I develop novel computational models of brain and cognition, mostly within the framework of probabilistic generative models and active inference (but sometimes also dynamical systems or connectionist – or combinations of these approaches). I proposed novel computational approaches

to a variety of cognitive abilities, including perception, decision, planning and learning. In turn, these models offer empirical prediction that I test experimentally. Key publications:

- Donnarumma, F., Costantini, M., Ambrosini, E., Friston, K., **Pezzulo, G.** (2017) Action perception as hypothesis testing. *Cortex* in press
- Friston, K., FitzGerald, T., Rigoli, F., Schwartenbeck, P., O'Doherty, J., **Pezzulo, G.** (2016) Active inference and learning. *Neuroscience & Biobehavioral Reviews*, 68: 862-879.
- Friston, K., FitzGerald, T., Rigoli, F., Schwartenbeck, P., **Pezzulo, G.** (2016) Active inference: A process theory. *Neural Computation*, 29(1): 1-49.

Team Leadership

Since I obtained my first EU-funded grant in 2009, I hired numerous collaborators and post-docs (see my detailed research profile below). At the moment I lead a research team that includes three post-docs – Francesco Donnarumma, Pierpaolo Iodice and Ivilin Stoianov – all funded through one of my research grants (HFSP) as Researchers, III Level (Fixed-term Position, Art. 23). The activities of my research team are increasingly fruitful, as testified (for example) by the growing number of joint publications in high-impact international journals. Some example publications with each of the post-docs as first author and me as last author:

- Donnarumma, F., Maisto, D., **Pezzulo, G.** (2016) Problem solving as probabilistic inference with subgoal: explaining human successes and pitfalls in the Tower of Hanoi. *PLOS Computational Biology* 12(4): e1004864
- Iodice, P., Ferrante, C., Brunetti, L., Cabib, S., Protasi, F., Walton, M., **Pezzulo, G.** (2017) Fatigue modulates dopamine availability and promotes flexible choice reversals during decision making, *Scientific Reports*, in press
- Stoianov, I., Genovesio, A., **Pezzulo, G.** (2016) Prefrontal goal-codes emerge as latent states in probabilistic value learning. *Journal of Cognitive Neuroscience*, 28(1):140-57

International network of collaborations

I am actively collaborating and co-authoring papers with leading scientists in the fields of cognitive / experimental psychology and computational neuroscience, which include for example: Karl Friston and Ray Dolan (Wellcome Trust / UCL), Paul Cisek (Montreal), Paul Verschure (Pompeu Fabra), Cyriel Pennartz (Amsterdam), Christian Balkenius (Lund), Lawrence Barsalou (Glasgow), Mark Walton (Oxford), Nathan Lepora (Bristol), Michael Levin (Tufts), Guenther Knoblich and Natalie Sebanz (Central European University), Matt van der Meer (Dartmouth College), Caleb Kemere (Rice). Details on our joint publications can be found in [Google Scholar](#), [ORCID](#), or [my webpage](#).

Detailed Scientific Biography

Research Career

- 23/05/2013–
now **Researcher III Level (Permanent Position)**, *Institute of Cognitive Sciences and Technologies, National Research Council, Rome, Italy*, (Transferred from ILC-CNR, Prot. 0001795, 23/05/2013).
- 09/02/2009–
22/05/2013 **Researcher III Level (Permanent Position)**, *Institute of Computational Linguistics "Antonio Zampolli", National Research Council, Pisa, Italy*, (Prot. 0000055, 09/02/2009).
- 01/06/2007–
31/05/2008 **Researcher III Level (Fixed-term Position, Art. 23)**, *ISTC-CNR, Rome, Italy*, (Prot. 0001410, 29/05/2007; extension: Prot. 0025202, 18/02/2008).
- 02/11/2004–
31/05/2007 **Assegno di ricerca**, *ISTC-CNR, Rome, Italy*, (Prot. 1830, 25/10/2004 and extensions, Prot. 0001605, 20/10/2006; Prot. 2009, 28/12/2005; Prot. 0000708, 19/06/2006; Prot. 0000437, 20/02/2007).
- 15/02/2002–
31/10/2004 **Assegno di ricerca**, *ISTC-CNR, Rome, Italy*, (Prot. 145, 28/01/2002 and extensions: Prot. 1821, 02/10/2002; Prot. 1001, 19/06/2003; Prot. 1585, 17/09/2004).
- 01/01/2001–
14/02/2002 **Researcher, fixed term**, *ITC-IRST, Trento, Italy*, (Prot. not found).
- 01/01/2000–
31/12/2000 **Researcher, fixed term**, *ITC-IRST, Trento, Italy*, (Prot. 28811/PD-b).
- 19/04/1999–
31/12/1999 **Researcher, fixed term**, *ITC-IRST, Trento, Italy*, (Prot. 27330/PD-b).
- 22/05/1997–
21/05/1998 **Military service.**
- 01/11/96–
30/04/1997 **Visiting Researcher**, *CREPCO-CNRS and University of Aix-en-Provence, France*.

Grants and Team Responsibilities

- 2014 – now **Team Leader**, of the project "*Beyond simple choices: computational and neuronal mechanisms for complex spatial behaviors*", funded by the Human Frontiers Science Program (HFSP, RGY0088/2014), <http://www.hfsp.org/>, (Prot. 0004056, 12/11/2004).
- 2011– 2014 **Project Coordinator**, of the project "*Goal-Leaders: Goal-directed, Adaptive Builder Robots*", funded by EU's 7th Framework Programme (FP7-ICT-STRP-270108), <http://www.goal-leaders.eu/>, (Prot. 0003873, 16/12/2010).
- 2009–2013 **Team Leader**, of the project "*HUMANOBS: Humanoids that learn socio-communicative skills through observation*", funded by EU's 7th Framework Programme (FP7-ICT-STRP-231453), <http://www.humanobs.org/>, (Prot. 0002954, 13/11/2008).
- 2011–2014 **Coordinator Contact**, of the project "*WORHD: Written language processing in Hearing and Deaf*", funded by EU's 7th Framework Programme (FP7, PEOPLE-2007-2-2.ERG, Grant Agreement No. 224919).

- 2004–2007 **Participant**, in the project "*MindRACES, from Reactive to Anticipatory Cognitive Embodied Systems*", funded by EU's 6th Framework Programme (FP6-IST-511931), <http://mindraces.org/>.
- 2004 **Participant**, in the project "*TICCA, Tecnologie cognitive e per l'interazione e la cooperazione con agenti artificiali*", funded by Provincia autonoma di Trento (IST - 2001 - 37599), <http://pfstar.itc.it/public/p.htm>.
- 1999–2003 **Participant**, in the projects *HIPS* (1999), *Ercolano-on-line* (2000), *WordNet* (2001), *SENSEVAL-2* (2001), *WebFaq-TEXTEC* (2001-2002), *ALFEBIITE* (2000-2003).

Honors and Awards

- 2014 Young Investigator Award, Human Frontiers Science Program (RGY0088/2014)
- 2008 Visiting Scholarship, European Network for the Advancement of Artificial Cognitive Systems, Interaction and Robotics (EUCognition). Venue: University of York, UK
- 1996 Visiting grant awarded by University of Pisa to visit CREPCO-CNRS, Aix-en-Provence University, for 6 months, starting 01/11/96 (DR 9641, 17/12/96, disc. area 11)

Invited presentations

- Nov 17 2016 CogSci Research Platform University of Vienna, Austria
- Nov 8 2016 University La Cattolica, Milan, Italy
- Oct 11-14 2016 Lyon Active Inference Workshop, Lyon, France
- Apr 4-5 2016 Workshop on: From Human-Human Joint Action to Human-Robot Joint Action; Toulouse University, France
- Apr 1 2015 Workshop on: Modeling in cognitive neuroscience; University of Padua, Italy
- Mar 12 2015 Free energy Workshop 2015; UCL, London, UK
- Dec 11 2014 University Pompeu Fabra, Barcelona, Spain
- Nov 6–7 2014 Anatomy of Choice meeting, UCL, London, UK
- Oct 26–31 2014 Ernst Strüngmann Forum, Where's the Action? The Pragmatic Turn in Cognitive Science. Frankfurt, Germany
- Jan 30 2012 Central European University, Budapest
- Feb 2011 University of Nijmegen
- Sept 3-14 2012 Barcelona Cognition, Brain and Technology Summer School 2012 - BCBT, Barcelona, Spain.
- Mar 5–8 2012 Workshop on: Reading Intentions, Lund University, Sweden
- Feb 23–24 2012 5th International Conference on Cognitive Systems: CogSys 2012, Wien
- Oct 2010 Neuroscience of Sport Symposium, AIPS 2010, Chieti, Italy
- Aug 13 2010 Symposium on: The Mechanics of Embodiment, CogSci 2010, Portland, Oregon USA

Education

- 2006/03/02 PhD: Cognitive Psychology, "Psicologia Cognitiva, Psicofisiologia, Personalità" (University of Rome "La Sapienza"). Thesis: *Into the Gambler's Frame of Mind: Decision Making under Uncertainty in the Two Cards Gambling Game*
- 1999/11/19 Master in Philosophy and the Foundations of Physics, Epistemology School, University of Bologna-Cesena
- 1996/06/25 Laurea degree in Philosophy, University of Pisa. Thesis: *A Cognitive model of scientific revolutions*. Score: 110/110 cum laude

Teaching and Habilitations

- 2017 Italian National Scientific Habilitation to function as Full Professor, Disciplinary area 11/E1: General psychology, psychobiology, psychometrics, Call 1532/2016 (valid until 10/04/2023)
- 2014 Short course on *Embodied Cognition*, International Telematic University Uninettuno
- 2013 Italian National Scientific Habilitation to function as Associate Professor, Disciplinary area 11/C2: Logic, history and philosophy of science, Call 2012 DD. n. 222/2012
- 2013 Italian National Scientific Habilitation to function as Associate Professor, Disciplinary area 11/E1: General psychology, psychobiology, psychometrics, Call 2012 DD. n. 222/2012
- 2001 Professor of Philosophy, Psychology and Sociology in *Istituto Magistrale "R. Pantini"*, Vasto, CH - Italy (secondary school)
- 2000 Habilitation for teaching at secondary schools (36A and 37A)

Membership in scientific boards

- 2014-now Board member (Collegio dei Docenti), PhD programme in Psychology and Cognitive Science, University of Rome, La Sapienza
- 2008-2010 Board Member of *AISC, Associazione Italiana di Scienze Cognitive*
- 2011-now Member of *IEEE Task Force on Towards Human-like Intelligence*

Editorial boards and reviewing activities

- Member of Editorial Board: *Connection Science*, *Journal of Artificial General Intelligence*, *Topoi*
- Review Editor, *Frontiers in Cognition*, *Frontiers in Neurorobotics*
- Reviewer for many international journals in interdisciplinary research (Science, Nature Communications, Plos Computational Biology, Plos ONE), neuroscience (Cortex, Cerebral Cortex, Experimental Brain Research), AI / robotics (Artificial Intelligence, Proceedings of the IEEE, Frontiers in Neurorobotics, Paladyn Journal of Behavioral Robotics, Connection Science, Adaptive Behavior), cognitive science / psychology (Cognition, Cognitive Psychology, Cognitive Science, Developmental Review, Cognitive Processing, Frontiers in Psychology, Psychological Research, Psychological Science, New Ideas in Psychology, Review of Philosophy and Psychology)
- Reviewer for international conferences, e.g., AAMAS, BICA, CogSci, IROS, IJCAI, ICDL, ROMAN
- Scientific Committee of: Language Resources and Evaluation Conference (LREC), 2006 and 2008; IEEE International Symposium on Industrial Electronics, 2007; Living Machines 2014; Italian

Participation in PhD thesis committees

- Miquel Ramirez, Universitat Pompeu Fabra, Barcelona, Spain (17/05/2012);
- Cesar Renno-Costa, Universitat Pompeu Fabra, Barcelona, Spain (17/09/2012);
- Amir Sadeghipour, Bielefeld, Germany (17/10/2014);
- Encarnación Marcos, Universitat Pompeu Fabra, Barcelona, Spain (12/12/2014),
- Riccardo Zucca, Universitat Pompeu Fabra, Barcelona, Spain (13/02/2015)

Scientific supervisions

- Scientific supervisor, post-docs: Ivilin Stoianov, Francesco Donnarumma and Pierpaolo Iodice
- Scientific supervisor, PhD students: Boris Quetard, Leo Lopez (Clermont-Ferrand University)
- Former scientific supervisor: Laura Barca (now hired at ISTC-CNR), Marcello Ferro (now hired at ILC-CNR), Dimitri Ognibene (now hired at Pompeu Fabra, Barcelona), Francesco Rigoli (now hired at City University, London), Fabian Chersi (now hired at UCL, London), Nicola Catenacci (now hired at the University of Hertfordshire)
- Former Scientific supervisor, master thesis: Gianguglielmo Calvi (University of Pisa), Vieri Santucci (University of Rome La Sapienza), Nicole Cilia (University of Rome La Sapienza)

Project evaluations

- Evaluator of EU projects, 2015 and 2016
- Evaluator for the French National Research Agency (ANR) in the framework of its Blue-Sky programme, January 2013
- Evaluator for Templeton World Charity Foundation, December 2013

Guest editor

- Guest editor for the *Philosophical Transactions of the Royal Society B* Journal (Elsevier), 2014: *The principles of goal-directed decision-making: from neural mechanisms to computation and robotics*, <http://rstb.royalsocietypublishing.org/site/2014/goal.xhtml>
- Guest editor for the *New Ideas in Psychology* Journal (Elsevier), 2011
- Guest editor for the *Psychological Research* Journal (Springer), issue 4/5, 2009
- Guest editor for the *Cognitive Processing* Journal (Springer), vols. 8(1) and 8(2), 2007

Events organization

- Co-organizer of the *workshop on Internally generated sequences in the hippocampus*, September 28-30th, 2016 in Ariccia (Rome), Italy.
- Co-organizer of the *Barcelona Cognition, Brain and Technology summer school. BCBT 2013*, Barcelona, Spain, Sept 2-13, 2013
- Co-organizer of the *Fifth Workshop on Anticipatory Behavior in Adaptive Learning Systems (ABiALS 2010/11)*, 21-22 February 2011, ZiF, University of Bielefeld, Germany.
- Co-organizer of the *Fourth Workshop on Anticipatory Behavior in Adaptive Learning Systems (ABiALS 2008)*, 26 June 2008, Munich, Municon - Munich Airport Conference Centre, Germany.
- Co-organizer of the *Third Workshop on Anticipatory Behavior in Adaptive Learning Systems (ABiALS 2006)*, September 30th, 2006, in association with the conference *Simulation of Adaptive Behavior (SAB 2006)* in Rome, Italy.

Videolectures

- Sept 3–14, **BCBT 2012, Barcelona**, *Seeing the world through the lens of a predictive brain*, 2012 <https://www.youtube.com/watch?v=X0rmZTmx7ko>.
- Feb 23–24, **Cogsys 2012, Wien**, *The Goal-Leaders project: Goal-directed, Adaptive Builder* 2012 *Robots*, http://videolectures.net/cogsys2012_pezzulo_builder/.

Publications

- [1] Daniele Caligiore, Giovanni Pezzulo, Gianluca Baldassarre, Andreea C. Bostan, Peter L. Strick, Kenji Doya, Rick C. Helmich, Michiel Dirkx, James Houk, Henrik Jorntell, Angel Lago-Rodriguez, Joseph M. Galea, R Chris Miall, Traian Popa, Asha Kishore, Paul F M J. Verschure, Riccardo Zucca, and Ivan Herreros. Consensus paper: Towards a systems-level view of cerebellar function: the interplay between cerebellum, basal ganglia, and cortex. *Cerebellum*, 16(1):203–229, 2017. [IF 2015: 2.429].
- [2] Francesco Donnarumma, Marcello Costantini, Ettore Ambrosini, Karl Friston, and Giovanni Pezzulo. Action perception as hypothesis testing. *Cortex*, 2017. [IF 2015: 4.314].
- [3] Francesco Donnarumma, Haris Dindo, and Giovanni Pezzulo. You cannot speak and listen at the same time: a probabilistic model of turn-taking. *Biological Cybernetics*, 2017. [IF 2015: 1.611].
- [4] Francesco Donnarumma, Haris Dindo, and Giovanni Pezzulo. Sensorimotor coarticulation in the execution and recognition of intentional actions. *Frontiers in Psychology*, 8:237, 2017. [IF 2015: 2.463].
- [5] Pierpaolo Iodice, Claudio Ferrante, Luigi Brunetti, Simona Cabib, Feliciano Protasi, Mark Walton, and Giovanni Pezzulo. Fatigue modulates dopamine availability and promotes flexible choice reversals during decision making. *Scientific Reports*, 2017. [IF 2015: 5.228].
- [6] Michael Levin, Giovanni Pezzulo, and Joshua M. Finkelstein. Endogenous bioelectric signaling networks: Exploiting voltage gradients for control of growth and form. *Annual Review of Biomedical Engineering*, 2017. [IF 2015: 10.256].
- [7] Giovanni Pezzulo, Pierpaolo Iodice, Francesco Donnarumma, Haris Dindo, and Günther Knoblich. Avoiding accidents at the champagne reception: A study of joint lifting and balancing. *Psychological Science*, 2017. [IF 2015: 5.476].
- [8] Giovanni Pezzulo, Caleb Kemere, and Matthijs van der Meer. Internally generated hippocampal sequences as a vantage point to probe future-oriented cognition. *Annals of the New York Academy of Sciences*, 2017. [IF 2015: 4.518].
- [9] Giovanni Pezzulo. Tracing the roots of cognition in predictive processing. In Thomas K. Metzinger and Wanja Wiese, editors, *Philosophy and Predictive Processing*, chapter 20. MIND Group, Frankfurt am Main, 2017.
- [10] Francesco Rigoli, Giovanni Pezzulo, Raymond Dolan, and Karl Friston. A goal-directed framework for categorization. *Frontiers in Psychology*, 22, 2017. [IF 2015: 2.463].
- [11] Karl Friston, Thomas FitzGerald, Francesco Rigoli, Philipp Schwartenbeck, John O’Doherty, and Giovanni Pezzulo. Active inference and learning. *Neuroscience & Biobehavioral Reviews*, 68:862–879, 2016. [IF 2015: 8.58].
- [12] Karl Friston, Thomas FitzGerald, Francesco Rigoli, Philipp Schwartenbeck, and Giovanni Pezzulo. Active inference: A process theory. *Neural Computation*, 29(1):1–49, 2016. [IF 2015: 1.626].
- [13] Boris Quétard, Jean Charles Quinton, Martial Mermillod, Laura Barca, Giovanni Pezzulo, Michèle Colomb, and Marie Izaute. Differential effects of visual uncertainty and contextual guidance on perceptual decisions: Evidence from eye and mouse tracking in visual search. *Journal of Vision*, 16(11):28–28, 2016. [IF 2015: 2.341].
- [14] Giovanni Pezzulo and Michael Levin. Top-down models in biology: Explanation and control of complex living systems above the molecular level. *Journal of the Royal Society Interface*, 13(124):20160555, 2016. [IF 2015: 3.818].

- [15] Leo Pio-Lopez, Ange Nizard, Karl Friston, and Giovanni Pezzulo. Active inference and robot control: a case study. *Journal of the Royal Society Interface*, 13(122), Sep 2016. [IF 2015: 3.818].
- [16] Giovanni Pezzulo and Paul Cisek. Navigating the affordance landscape: Feedback control as a process model of behavior and cognition. *Trends in Cognitive Sciences*, 20(6):414–424, Jun 2016. [IF 2015: 17.850].
- [17] Giovanni Pezzulo, Emilio Cartoni, Francesco Rigoli, Leo Pio-Lopez, and Karl Friston. Active inference, epistemic value, and vicarious trial and error. *Learning & Memory*, 23(7):322–338, Jul 2016. [IF 2015: 2.906].
- [18] Giovanni Pezzulo, Alessandro D'Ausilio, and Andrea Gaggioli. Predictive technologies: Can smart tools augment the brain's predictive abilities? *Frontiers in Neuroscience*, 10:186, 2016. [IF 2015: 3.634].
- [19] G. Pezzulo. The mechanisms and benefits of a future-oriented brain. In K. Michaelian, S. B. Klein, and K. K. Szpunar, editors, *Seeing the Future: Theoretical Perspectives on Future-Oriented Mental Time Travel*. Oxford University Press, 2016.
- [20] G. Pezzulo, G. Vosgerau, U. Frith, A. Hamilton, C. Heyes, A. Iriki, H. Jorntell, P. Konig, S. Nagel, P.-Y. Oudeyer, R. Rupert, and A. Tramacere. Acting up: What difference does an action-oriented approach make to the study of cognitive development? In A.K. Engel, K.J. Friston, and D. Kragic, editors, *The Pragmatic Turn. Toward Action-Oriented Views in Cognitive Science*. MIT Press, 2016.
- [21] G. Pezzulo. The contribution of pragmatic skills to cognition and its development: common perspectives and disagreements. In A.K. Engel, K.J. Friston, and D. Kragic, editors, *The Pragmatic Turn. Toward Action-Oriented Views in Cognitive Science*. MIT Press, 2016.
- [22] Giovanni Pezzulo. Toward mechanistic models of action-oriented and detached cognition. *Behavioral and Brain Sciences*, 39:e130, Jan 2016. Commentary. [IF 2015: 20.415].
- [23] P. Iodice, G. Lessiani, G. Franzone, and G. Pezzulo. Efficacy of pulsed low-intensity electric neuromuscular stimulation in reducing pain and disability in patients with myofascial syndrome. *Journal of biological regulators and homeostatic agents*, 30(2):615–620, 2016. [IF 2015: 1.546].
- [24] Ivilin Stoianov, Aldo Genovesio, and Giovanni Pezzulo. Prefrontal goal codes emerge as latent states in probabilistic value learning. *Journal of Cognitive Neuroscience*, 28(1):140–157, 2016. [IF 2015: 3.559].
- [25] Annique Smeding, Jean-Charles Quinton, Kelly Lauer, Laura Barca, and Giovanni Pezzulo. Tracking and simulating dynamics of implicit stereotypes: A situated social cognition perspective. *Journal of personality and social psychology*, 111(6):817, 2016. [IF 2015: 4.736].
- [26] Francesco Rigoli, Giovanni Pezzulo, and Raymond J. Dolan. Prospective and pavlovian mechanisms in aversive behaviour. *Cognition*, 146:415–425, Jan 2016. [IF 2015: 3.411].
- [27] D. Maisto, F. Donnarumma, and G. Pezzulo. Nonparametric problem-space clustering: Learning efficient codes for cognitive control tasks. *Entropy*, 18(2):61, 2016. [IF 2015: 1.743].
- [28] Francesco Donnarumma, Domenico Maisto, and Giovanni Pezzulo. Problem solving as probabilistic inference with subgoalings: Explaining human successes and pitfalls in the tower of hanoi. *PLoS Computational Biology*, 12(4):e1004864, Apr 2016. [IF 2015: 4.587].
- [29] G. Pezzulo and M. Levin. Re-membering the body: applications of computational neuroscience to the top-down control of regeneration of limbs and other complex organs. *Integrative Biology*, 7(12):1487–1517, Dec 2015. [IF: 3.371].
- [30] Laura Barca, Filippo Benedetti, and Giovanni Pezzulo. The effects of phonological similarity on the semantic categorization of pictorial and lexical stimuli: evidence from continuous behavioral measures. *Journal of Cognitive Psychology*, 28(2):159–170, 2015. [IF: 1.892].
- [31] D. Donnarumma, R. Prevete, A. De Giorgio, G. Montone, and G. Pezzulo. Learning programs is better than learning dynamics: A programmable neural network hierarchical architecture in a multi-task scenario. *Adaptive Behavior*, 24(1):27–51, 2015. [IF: 1.098].
- [32] Francesco Donnarumma, Roberto Prevete, Fabian Chersi, and Giovanni Pezzulo. A programmer-interpreter neural network architecture for prefrontal cognitive control. *International Journal of Neural Systems*, 25(6):1550017, Sep 2015. [IF 2015: 6.085].

- [33] Cinzia Calluso, Giorgia Committeri, Giovanni Pezzulo, Nathan Lepora, and Annalisa Tosoni. Analysis of hand kinematics reveals inter-individual differences in intertemporal decision dynamics. *Experimental Brain Research*, 233(12):3597–3611, Dec 2015. [IF: 2.057].
- [34] Matteo Candidi, Arianna Curioni, Francesco Donnarumma, Lucia Maria Sacheli, and Giovanni Pezzulo. Interactional leader-follower sensorimotor communication strategies during repetitive joint actions. *Journal of the Royal Society Interface*, 12(110):20150644, 2015. [IF: 3.818].
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