

Curriculum vitae

LUCA BONINI

PERSONAL INFORMATION

Name: Luca Bonini

Date of birth: January 19, 1979

Nationality: Italian

EDUCATION

- 2008: PhD in Neuroscience, University of Parma. Title of the thesis: “Organization of the intentional action and understanding of motor intentionality in monkey parieto-frontal circuits”, supervisor prof. Leonardo Fogassi.
- 2003: Degree in Psychology (110/110 cum laude) at the University of Parma. Title of the thesis: “Construction of an advanced Theory of Mind test: validation study and assessment of patients with brain lesions”, supervisor Prof. Paolo Nichelli.

CURRENT POSITION

- Associate Professor of “General Psychology, Psychobiology and Psychometry” at the University of Parma.

PREVIOUS POSITIONS

- 2012-2016: Senior post-doc at the Italian Institute of Technology (IIT, Genova, Italy), “Brain Center for Social and Motor Cognition”.
- 2010–2012: Junior post-doc at the Italian Institute of Technology (IIT, Genova, Italy), “Brain Center for Social and Motor Cognition”.
- 2008–2010: Fellowship at the Department of Neuroscience, University of Parma.
- 2004-2008: PhD program in Neuroscience, University of Parma, director Prof. Giacomo Rizzolatti, supervisor Prof. Leonardo Fogassi.
- September 2003 – March 2004: Internship at the Department of Neurology, University of Modena, under the supervision of Prof. Paolo Nichelli.

FELLOWSHIPS AND AWARDS

- 2017 – Winner of an Italian MIUR grant “FARE” (€239.840), title: “Motor and cognitive functions of the cortico-basal ganglia circuits in the monkey: from the laboratory to free social interactions” (acronym: GANGLIA).
- 2017 - National Scientific Habilitation to the role of Full Professor of “Physiology”.
- 2016 – Winner of an ERCstg Grant (€1.499.338), title: “Motor and cognitive functions of the monkey premotor cortex during free social interactions” (acronym: WIRELESS).

- 2015 - National Scientific Habilitation to the role of Associate Professor of “General Psychology, Psychobiology and Psychometry”.
- 2013 - Travel award (\$1000) of the Federation of the European Neuroscience Society (FENS) to attend the SfN Annual Meeting in San Diego (CA).
- 2009 - Fellowship at the Department of Neuroscience, University of Parma. Title of the project: “Neuronal substrates for the organization and understanding of intentional actions in monkey”.
- 2008 - Post-doctoral fellow at the Department of Neuroscience, University of Parma. Title of the project: “Neural correlates of vocalization in the monkey”.
- 2004 - Winner of the competitive call for a PhD fellowship in Neuroscience, University of Parma.
- 1999 - 2000 and 2003 – Money prize as Best Student of the year of the course in Psychology of the University of Parma.

SUPERVISION OF GRADUATE AND UNDERGRADUATE STUDENTS, AND POST-DOCTORAL FELLOWS

- 2013 to date: supervision of 4 graduate students.
- 2008 to date: supervision and training of 3 doctoral students enrolled in the PhD program of Neuroscience of the University of Parma, then employed as post-doctoral fellows.
- 2008 to date: supervision of more than 40 undergraduate students in Psychology at the University of Parma (Italy).
- 2008-2010: supervision of 10 undergraduate students in Psychology at the University of Urbino (Italy).

TEACHING ACTIVITIES

- Teacher of “Neuroscience” and “Animal and comparative psychobiology” at the University of Parma.
- 2014 to date: teacher of Neurophysiological techniques in the PhD in Neuroscience of the University of Parma, and from 2017 member of the teachers’ board of the same PhD training program.
- 2014 to 2015: teacher of Neurophysiology at the “Academy of Developmental Neuropsychology (ANSVI), Parma.
- 2010: Contract professor of “Social and cognitive Neurosciences”, school of Psychology, University of Urbino.
- 2009 – 2010: Contract professor of “Principles of Neural Sciences”, school of Psychology, University of Urbino.
- 2009 – 2010: Contact professor of “Cognitive Psychobiology”, school of Psychology, University of Parma.
- 2009: Contract professor of “Neurophysiology”, school of Psychology, University of Urbino.
- 2009: Contract professor of “Neuroscience”, school of Psychology, University of Parma.

MEMBERSHIPS OF SCIENTIFIC SOCIETIES

- 2008 to date: member of the Society for Neuroscience.

REVIEWING ACTIVITY

Member of the editorial board of Scientific Reports (Nature Publishing group).

Reviewer for different European funding agencies (FWO, ERC).

Reviewer for International peer reviewed journals: Cerebral Cortex, eLife, European Journal of Neuroscience, Journal of Cognitive Neuroscience, Journal of Neurophysiology, PloS One, Proceedings of the Royal Society of London B, Scientific Reports.

MAJOR COLLABORATIONS

- Giovanni Pezzulo, Computational modelling of action performance and recognition, mirror function, and joint actions, Istituto di Scienze e Tecnologie della Cognizione (ISTC) – National Research Council, Roma – Italy.
- Guy Orban, Test and use of new cylindrical probes for stereoEEG and single unit recording in monkeys, University of Parma, Department of Neuroscience, Parma – Italy.
- Patrick Ruther, Micromechanics and engineering applied to probe development and construction, Institut für Mikrosystemtechnik (IMTEK) – University of Freiburg, Freiburg – Germany.

INVITED TALKS AND CONFERENCE TALKS

- Mirroring others' actions in the monkey frontal cortex. Action, Brain, Language, & Evolution (ABLE) Meeting, Dec 1-2 2014, Rome (Italy)
- Mirror neurons, social learning and evolution. Unistem Day, March 14 2014, Federico II University, Napoli (Italy).
- Using U-Probe for recording in awake monkey. 30th Plexon Anniversary Technical Workshop, April 29 – May 2, 2013 – Dallas, TX (USA).
- Influence of the sight of monkey's own acting hand on the motor discharge of ventral premotor mirror neurons. 16th World Congress of the International Organization of Psychophysiology, Sept 13-17 2012, Pisa (Italy).
- Neural mechanisms underlying the encoding of grasping acts during the execution of goal directed actions. Dept. of Neurobiology and Behavior, Stony Brook University, NY (USA), Nov 10 2011.
- Comparing mirror systems in human and non-human primates in relation to higher cognitive functions. New Studies of Neurobehavioral Evolution, June 25-28 2010 - Washington, DC (USA).
- Understanding others through mirror neurons. Brain Awareness Week, March 18-20 2009 – Napoli (Italy).
- Mirror neurons. Brain Awareness Week, March 13-14 2008 – Napoli (Italy).
- Chaining motor acts into goal directed actions: the role of the inferior parietal convexity. 1st Annual meeting Primate Neurobiology, 27-29 Febbraio 2008 – Tübingen (Germany).
- Functional organization and control of intentional actions in monkey parieto-frontal circuits. Annual symposium of the IAP meeting, Dec 13 2007 - Leuven (Belgium).

ABSTRACT IN INTERNATIONAL CONFERENCES

Presenter

Bonini, L., Livi, A., Lanzilotto, M., Maranesi, M., Ruther, P., Barz, F., Fogassi, L., Rizzolatti, G. (2015) Visuo-motor processing of objects in pre-supplementary motor area F6 neurons of the macaque. SfN Abs. 601.14/L36.

Bonini, L., Maranesi, M., Livi, A., Fogassi, L., Rizzolatti, G. (2013) Mirror neurons responding to inaction in the monkey ventral premotor cortex. SfN Abs. 263.19.

- Bonini, L.**, Maranesi, M., Caselli, L., Livi, A., Bimbi, M., Fogassi, L., Rizzolatti, G. (2012) Functional characterization of monkey ventral premotor grasping neurons classes during execution and observation of a visuo-motor task. SfN Abs 78.04/FF5.
- Maranesi, M., Ugolotti Serventi, F., Bimbi, M., Bruni, S., Fogassi, L., **Bonini, L.** (2011) Monkey gaze behavior during action observation and its relationship with mirror neurons activity. SfN 914.04/QQ9.
- Fogassi, L., **Bonini, L.**, Ugolotti, F., Simone, L., Rozzi, S., Rizzolatti, G., Ferrari, P.F. (2008) The gaze direction of an observed agent influences the discharge of parietal but not of premotor hand mirror neurons. Soc. Neurosci. Abs.
- Bonini, L.**, Rozzi, S., Simone, L., Ugolotti, F., Bastoni, E., Macellini, S., Ferrari, P.F., Fogassi, L. (2008) Reversible inactivation of inferior parietal lobule but not of ventral premotor cortex impairs organization of goal directed actions. FENS Abs. A022.2.
- Bonini, L.**, Ferrari, P.F., Ugolotti, F., Simone, L., Rozzi, S., Rizzolatti, G., Fogassi, L. (2006) Grasping neurons of monkey parietal cortex code the intentions of complex action sequences. FENS Abs. A217.3.

Co-author

- Livi, A., Lanzilotto, M., Maranesi, M., Gerbella, M., Fogassi, L., Rizzolatti, G., **Bonini, L.** (2016) Functional properties of mirror neurons of the monkey presupplementary motor area F6. Abs 805.05/FF1.
- Pothof, F., **Bonini, L.**, Lanzilotto, M., Livi, A., Fogassi, L., Orban, G.A., Paul, O., Ruther, P. (2015) In-vivo validation of a cylindrical 64-channel depth probe with a diameter of 800 μm . SfN Abs 540.14/CC30.
- Bruni, S., **Bonini, L.**, Giorgetti, V., Siracusa, F., Barberini, E., Fogassi, L. (2014) Encoding of contextual affordances by monkey ventral premotor grasping neurons during goal-directed action sequences. SfN Abs 334.09/FF7.
- Maranesi, M., Bruni, S., Livi, A., Fogassi, L., Rizzolatti, G., **Bonini, L.** (2014) Time course of affordances processing in macaque ventral premotor neurons. SfN Abs 334.08/FF6.
- Bruni, S., Giorgetti, V., Siracusa, F., **Bonini, L.**, Fogassi, L. (2014) Activity of ventrolateral prefrontal neurons during the execution of goal directed action sequences. FENS Abs 2230.
- Maranesi, M., Livi, A., Fogassi, L., Rizzolatti, G., **Bonini, L.** (2014) Distinction between own and other's grasping hand in the ventral premotor cortex. FENS Abs R10186.
- Maranesi, M., Livi, A., **Bonini, L.**, Caselli, L., Rizzolatti, G., Fogassi, L. (2012) Influence of the sight of monkey's own acting hand on the motor discharge of mirror neurons. SfN Abs 78.06/FF7.
- Maranesi, M., Caselli, L., Livi, A., Bimbi, M., Fogassi, L., Rizzolatti, G., **Bonini, L.** (2012) Monkey dorsal premotor neurons can discharge during execution and observation of a reach-to-grasp motor task. FENS Abs. 87.22.
- Ugolotti Serventi, F., Bruni, S., **Bonini, L.**, Coudé, G., Ferrari, P.F., Rozzi, S., Fogassi, L. (2010) Functional anatomy of monkey parietal and premotor cortical sectors containing mirror neurons. FENS Abs. 051.22.
- Chersi, F., Fogassi, L., **Bonini, L.**, Rizzolatti, G., Ferrari, P.F. (2007) Modeling intentional neuronal chains in parietal and premotor cortex. SfN Abs. 636.6/DDD23.

- Fogassi, L., **Bonini, L.**, Simone, L., Ugolotti, F., Ruggeri, E., Rozzi, S., Rizzolatti, G., Ferrari, P.F. (2007) Time course of neuronal activity reflecting the final goal of observed and executed action sequences in monkey parietal and premotor cortex. *SfN Abs.* 636.4/DDD21.
- Ferrari, P.F., **Bonini, L.**, Ugolotti, F., Simone, L., Rozzi, S., Rizzolatti, G., Fogassi, L. (2006) Coding of motor intention in monkey parietal and premotor grasping neurons. *SfN* 255.1/X13.
- Coudé, G., Ferrari, P.F., Rozzi, S., Borelli, E., **Bonini, L.**, Rizzolatti, G., Fogassi, L. (2005) Motor control, sensorimotor integration, and cognitive functions of the cortical ventral motor areas of macaque monkey: a mapping study. *Soc. Neurosci. Abs.*, 194.2./KK27.

PUBLICATIONS

1. Maranesi, M., Livi, A., **Bonini, L.** (2017) Spatial and viewpoint selectivity for others' observed actions in monkey ventral premotor mirror neurons. *Sci Rep.* 7(1):8231
2. Barz, F., Livi, A., Lanzilotto, M., Maranesi, M., **Bonini, L.**, Paul, O., Ruther, P. (2017) Versatile, modular 3D microelectrode arrays for neuronal ensemble recordings: from design to fabrication, assembly, and functional validation in non-human primates. *J Neural Eng.* 14(3):036010.
3. Lanzilotto, M., Livi, A., Maranesi, M., Gerbella, M., Barz, F., Ruther, P., Fogassi, L., Rizzolatti, G., **Bonini, L.** (2016) Extending the cortical grasping network: pre-supplementary motor neuron activity during vision and grasping of objects. *Cereb Cortex* [Epub ahead of print doi:10.1093/cercor/bhw315].
4. Pothof, F., **Bonini, L.**, Lanzilotto, M., Livi, A., Fogassi, L., Orban, G.A., Paul, O., Ruther, P. (2016) Chronic neural probe for simultaneous recording of single-unit, multi-unit, and local field potential activity from multiple brain sites. *J Neural Eng.* 13(4):046006.
5. **Bonini, L.** (2016) The extended mirror neuron network: anatomy, origin, and functions. *Neuroscientist* DOI: 10.1177/1073858415626400.
6. Fogassi, L., **Bonini, L.** (2015) The role of mirror neurons in goal coding and intention understanding. In Ferrari, P.F., Rizzolatti, G. (ed.) *New frontiers in mirror neurons research*. Oxford University Press.
7. Bruni, S., Giorgetti, V., Fogassi, L., **Bonini, L.** (2015) Multimodal encoding of goal-directed actions in monkey ventral premotor grasping neurons. *Cereb Cortex* [Epub ahead of print PMID:26494802].
8. Maranesi, M., Livi, A., **Bonini, L.** (2015) Processing of own hand visual feedback during object grasping in ventral premotor mirror neurons. *J Neurosci* 35(34):11824-11829.
9. Bruni, S., Giorgetti, V., **Bonini, L.**, Fogassi, L. (2015) Processing and integration of contextual information in monkey ventrolateral prefrontal neurons during selection and execution of goal-directed manipulative actions. *J Neurosci* 35(34):11877-11890.
10. Maranesi, M., Livi, A., Fogassi, L., Rizzolatti, G., **Bonini, L.** (2014) Mirror neuron activation prior to action observation in a predictable context. *J Neurosci.* 34(45):14827-32.
11. **Bonini, L.**, Maranesi, M., Livi, A., Fogassi, L., Rizzolatti, G. (2014) Ventral premotor neurons encoding representations of action during self and others' inaction. *Curr Biol.* 24(14):1611-1614.

12. **Bonini, L.**, Maranesi, M., Livi, A., Fogassi, L., Rizzolatti, G. (2014) Space-dependent representation of objects and other's action in monkey ventral premotor grasping neurons. *J. Neurosci.*34(11):4108-4119.
13. Pothof, F., Anees, S., Leupold, L., **Bonini, L.**, Paul, O., Orban, G.A., Ruther, P. (2014) Fabrication and Characterization of a High-Resolution Neural Probe for Stereoelectroencephalography and Single Neuron Recording. Engineering in Medicine and Biology Society (EMBC), Annual Int. Conf. of the IEEE, Chicago; 08/2014.
14. Maranesi, M., **Bonini, L.**, Fogassi, L. (2014) Cortical processing of object affordances for self and others' action. *Front Psychol.* 5:538 doi: 10.3389/fpsyg.2014.00538.
15. **Bonini, L.**, Maranesi, M., Livi, A., Bruni, S., Fogassi, L., Holzhammer, T., Paul, O., Ruther, P. (2014) Application of floating silicon-based linear multielectrode arrays for acute recording of single neuron activity in awake behaving monkeys. *Biomed Tech (Berl)* 59(4):273-81.
16. **Bonini, L.**, Ferrari, P.F., Fogassi, L. (2013) Neurophysiological bases underlying the organization of intentional actions and the understanding of others' intention. *Conscious Cogn.* 22(3):1095-1104.
17. Maranesi, M., Ugolotti Serventi, F., Bruni, S., Bimbi, M., Fogassi, L., **Bonini, L.** (2013) Monkey gaze behaviour during action observation and its relationship to mirror neuron activity. *Eur J Neurosci.* 38(12):3721-3730.
18. **Bonini, L.**, Ugolotti Serventi, F., Bruni, S., Maranesi, M., Bimbi, M., Simone, L., Rozzi, S., Ferrari, P.F., Fogassi, L. (2012) Selectivity for grip type and action goal in macaque inferior parietal and ventral premotor grasping neurons. *J Neurophysiol* 108(6):1607-19.
19. Maranesi, M., Rodà, F., **Bonini, L.**, Rozzi, S., Ferrari, P.F., Fogassi, L., Coudé, G. (2012) Anatomic-functional organization of the ventral primary motor and premotor cortex in the macaque monkey. *Eur J Neurosci* 36(10):3376-87.
20. Macellini, S., Maranesi, M., **Bonini, L.**, Simone, L., Rozzi, S., Ferrari, P.F., Fogassi, L. (2012) Individual and social learning processes involved in the acquisition and generalization of tool-use in macaques. *Phil Trans R Soc* 367(1585):24-36.
21. **Bonini, L.**, Ugolotti Serventi, F., Simone, L., Rozzi, S., Ferrari, P.F., Fogassi, L. (2011) Grasping neurons of monkey parietal and premotor cortices encode action goals at distinct levels of abstraction during complex action sequences. *J Neurosci* 31(15): 5876-86.
22. **Bonini, L.**, Ferrari, P.F. (2011). Evolution of mirror systems: a simple mechanism for complex cognitive functions. *Ann N Y Acad Sci* 1225:166-175.
23. Macellini, S., Ferrari, P.F., **Bonini, L.**, Fogassi, L., Paukner, A. (2010) A modified mark test for own-body recognition in pig tailed macaques (*Macaca nemestrina*). *Animal Cognition* 13(4):631-9.
24. **Bonini, L.**, Rozzi, S., Ugolotti Serventi, F., Simone, L., Ferrari, P.F., Fogassi, L. (2010). Ventral premotor and inferior parietal cortices make distinct contribution to action organization and intention understanding. *Cereb Cortex* 20(6):1372-85.
25. Ferrari, P.F., **Bonini, L.**, Fogassi, L. (2009). From monkey mirror neurons to primate behaviours: possible 'direct' and 'indirect' pathways. *Phil Trans R Soc* 364(1528): 2311-23.
26. Rozzi, S., Ferrari, P.F., **Bonini, L.**, Rizzolatti, G., Fogassi, L. (2008). Functional organization of inferior parietal lobule convexity in the macaque monkey: electrophysiological characterization of motor, sensory and mirror responses and their correlation with cytoarchitectonic areas. *Eur J Neurosci* 28(8): 1569-88.