



Jose M. Carmena

*Curriculum Vitae**

Current Position

Associate Professor
Department of Electrical Engineering and Computer Sciences
Helen Wills Neuroscience Institute
Program in Cognitive Science
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Co-Director
Center for Neural Engineering and Prostheses (CNEP) at UC Berkeley and UC San Francisco
<http://www.cnep-uc.org>

Research Interests

- ❖ **Neural Engineering:** neuroprosthetic systems; human-machine systems; biomimetic robotics.
- ❖ **Systems & Cognitive Neuroscience:** brain-machine interfaces; neural basis of sensorimotor learning and control; neural ensemble computation;

Higher Education and Training

Postdoctoral fellow	Department of Neurobiology Duke University, Durham (NC)	2002-2005
Ph.D.	Robotics University of Edinburgh (UK)	2002
Dip.	Neurobiology Open University (UK)	2001
M.S.	Artificial Intelligence University of Edinburgh (UK)	1998
M.S.	Electrical Engineering University of Valencia (Spain)	1997
B.S.	Electrical Engineering Polytechnic University of Valencia (Spain)	1995

(*) Last updated April 2nd, 2012.

Positions and Employment

Associate Professor	Dept. of Electrical Eng. & Comp. Sciences, Program in Cognitive Science, and Helen Wills Neuroscience Institute, UC Berkeley (CA)	since 07/2011
Co-Director	Center for Neural Engineering and Prostheses UC Berkeley and UC San Francisco	since 12/2010
Assistant Professor	Dept. of Electrical Eng. & Comp. Sciences, Program in Cognitive Science, and Helen Wills Neuroscience Institute, UC Berkeley (CA)	since 07/2005
Postdoctoral Fellow	Dept. of Neurobiology, Ctr. for Neuroeng. Duke University, Durham (NC)	02/02 – 07/05
Lecturer	Division of Informatics University of Edinburgh (UK)	9/01–02/02
Teaching Assistant	Division of Informatics University of Edinburgh (UK)	10/98–06/01
Visiting researcher	Department of Artificial Intelligence University of Edinburgh (UK)	07–08/96
Research assistant	Robotics Institute University of Valencia (Spain)	10/95–09/97

Honors and Awards

- ❖ IEEE Engineering in Medicine and Biology Society Early Career Achievement Award, 2011
- ❖ New York Academy of Sciences – Aspen Brain Forum Prize in Neurotechnology, 2010
- ❖ National Science Foundation CAREER Award, 2010
- ❖ Alfred P. Sloan Foundation Research Fellow, 2009
- ❖ Senior Member IEEE, 2009
- ❖ Distinguished Lecturer, IEEE-SMC 2009-2011
- ❖ Christopher and Dana Reeve Foundation Fellowship, 2007
- ❖ Okawa Foundation Research Award, 2007
- ❖ UC Berkeley Hellman Family Faculty Fund Award, 2007
- ❖ Christopher Reeve Paralysis Foundation Postdoctoral Fellowship, 2003
- ❖ Best Conference Paper, EUROBOT Conference, Lund (Sweden), 2001
- ❖ PhD-Scholarship, EU TMR-Network SMART2, 1998–2001
- ❖ MSc-Scholarship, Student Awards Agency of Scotland, (UK), 1997–1998
- ❖ Suma Cum Laude, University of Valencia (Spain), 1997

Memberships

- ❖ Institute of Electrical and Electronics Engineers (IEEE)
 - EMB, RA, and SMC Societies
- ❖ The Neural Control of Movement Society
- ❖ Society for Neuroscience

Publications

Journal Articles

1. Koralek A.C., Jin X., Long J.D., Costa R.M. and **Carmena J.M.** (2012) Corticostriatal plasticity is necessary for learning intentional neuroprosthetic skills. **Nature** 483(7389), pp. 331-335. [\[News and Views: Blake D.T. \(2012\) How brains learn to control machines. Nature 483\(7389\), pp. 284-285.\]](#)
2. Canolty R.T., Cadieu C.F., Koepsell K., Ganguly K., Knight R.T. and **Carmena J.M.** (2012) Detecting event-related changes of multivariate phase coupling in dynamic brain networks. **Journal of Neurophysiology** 107(7), pp. 2020-2031.
3. Orsborn A.L., Dangi S., Moorman H.G. and **Carmena J.M.** (2012) Closed-loop decoder adaptation on intermediate time-scales facilitates rapid BMI performance improvements independent of decoder initialization conditions. **IEEE Transactions on Neural Systems and Rehabilitation Engineering** doi: 10.1109/TNSRE.2012.2185066.
4. So K., Koralek A.C., Ganguly K., Gastpar M.C. and **Carmena J.M.** (2012) Assessing functional connectivity of neural ensembles using directed information. **Journal of Neural Engineering** 9(2):026004 doi:10.1088/1741-2560/9/2/02600.
5. Canolty R.T., Cadieu C.F., Koepsell K., Knight R.T. and **Carmena J.M.** (2012) Multivariate phase-amplitude cross-frequency coupling in neurophysiological signals. **IEEE Transactions on Biomedical Engineering** 59(1), pp. 8-11.
6. So K., Ganguly K., Jimenez J., Gastpar M., and **Carmena J.M.** (2011) Redundant information encoding in primary motor cortex during natural and neuroprosthetic control. **Journal of Computational Neuroscience** doi: 10.1007/s10827-011-0369-1.
7. Long J.D. and **Carmena J.M.** (2011) A statistical description of neural ensemble dynamics. **Frontiers in Computational Neuroscience** 5:52. doi: 10.3389/fncom.2011.00052.
8. Ganguly K., Wallis J.D. and **Carmena J.M.** (2011) Reversible large-scale modification of cortical networks during neuroprosthetic control. **Nature Neuroscience** 14, pp. 662-667. [\[Faculty of 1000, 'Recommended'\]](#)
9. Venkatraman S. and **Carmena J.M.** (2011) Active sensing of target location encoded by cortical microstimulation. **IEEE Transactions on Neural Systems and Rehabilitation Engineering** doi: 10.1109/TNSRE.2011.2117441.
10. Venkatraman S., Hendricks J., Richardson-Burns S., Jan E., Martin D.C. and **Carmena J.M.** (2011) *In vitro* and *in vivo* evaluation of PEDOT microelectrodes for neural stimulation and recording **IEEE Transactions on Neural Systems and Rehabilitation Engineering** doi: 10.1109/TNSRE.2011.2109399.

11. Canolty R.T., Ganguly K., Kennerley S.W., Cadieu C.F., Koepsell K., Wallis J.D. and **Carmena J.M.** (2010) Oscillatory phase coupling coordinates anatomically-dispersed functional cell assemblies. **Proceedings of the National Academy of Sciences** 107(40), pp.17356-17361.
12. Venkatraman S., Jin X., Costa R.M. and **Carmena J.M.** (2010) Using inertial sensors to investigate neural correlates of behavior in freely behaving rodents. **Journal of Neurophysiology** 104, pp. 569-575.
13. Ganguly K. and **Carmena J.M.** (2010) Neural correlates of skill acquisition with a cortical brain-machine interface. **Journal of Motor Behavior** 42(6), pp. 355-360.
14. Heliot R., Ganguly K., Jimenez J. and **Carmena J.M.** (2010) Learning in closed-loop brain-machine interfaces: modeling and experimental validation. **IEEE Transactions on Systems, Man and Cybernetics, part B** 40(5), pp. 1387-1397.
15. Heliot R., Orsborn A., Ganguly K. and **Carmena J.M.** (2010) System architecture for stiffness control in brain-machine interfaces. **IEEE Transactions on Systems, Man and Cybernetics, part A** 40(4), pp. 732-742.
16. Ganguly K., Secundo L., Ranade G., Orsborn A., Chang E.F., Dimitrov D.F., Wallis J.D., Barbaro N.M., Knight R.T. and **Carmena J.M.** (2009) Cortical representation of ipsilateral arm movements in monkey and man. **Journal of Neuroscience**, 29: 12948 – 12956.
17. Ganguly K. and **Carmena J.M.** (2009) Emergence of a stable cortical map for neuroprosthetic control. **PLoS Biology** 7(7), e1000153.doi:10.1371/journal.pbio.1000153. [*Faculty of 1000, 'Must Read'*]
18. Venkatraman S. and **Carmena J.M.** (2009) Behavioral modulation of stimulus-evoked oscillations in barrel cortex of alert rats. **Frontiers in Integrative Neuroscience** 3:10. doi:10.3389/neuro.07.010.2009 [*Comentary: Tort ABL and Katz DB (2010) Oscillations trumped by behavior: a link between sensory and direct electrical stimulation of cortical activity. Front. Neurosci. 4:39. doi: 10.3389/fnins.2010.00039*]
19. Venkatraman S., Long J.D., Elkabany K., Yao Y. and **Carmena J.M.** (2009) A system for neural recording and closed-loop intracortical microstimulation in awake rodents. **IEEE Transactions on Biomedical Engineering** 56(1), pp. 15-22.
20. Kim H.K., **Carmena J.M.**, Biggs S.J., Hanson T.L., Nicolelis M.A.L. and Srinivasan M.A. (2007) The muscle activation method: An approach to impedance control of brain-machine interfaces through a musculoskeletal model of the arm. **IEEE Transactions on Biomedical Engineering** 54(8), pp. 1520-1529.
21. Zacksenhouse M., Lebedev M.A., **Carmena J.M.**, O'Doherty J.E., Henriquez C.S. and Nicolelis M.A.L. (2007) Cortical modulations increase in early sessions with brain-machine interface. **PLoS One** 7, e619.
22. Kim S.-P., Sanchez J.C., Rao Y.N., Erdogmus D., **Carmena J.M.**, Lebedev M.A., Nicolelis M.A.L. and Principe J.C. (2006) A comparison of optimal MIMO linear and nonlinear models for brain-machine interfaces. **Journal of Neural Engineering** 3, pp. 145-161.
23. Kim H.K., Biggs S.J., Schloerb D.W., **Carmena J.M.**, Lebedev M.A., Nicolelis M.A.L. and Srinivasan M.A. (2006) Continuous shared control stabilizes reach and grasping with brain-machine interfaces. **IEEE Transactions on Biomedical Engineering** 53(6), pp. 1164-1173.

24. Gutierrez R., **Carmena J.M.**, Nicolelis M.A.L. and Simon S.A. (2006) Temporal specific ensembles of rat orbitofrontal neurons represent the drinking of liquid rewards. **Journal of Neurophysiology** 95, pp. 119-133.
25. **Carmena J.M.**, Lebedev M.A., Henriquez C.S. and Nicolelis M.A.L. (2005) Stable ensemble performance with single neuron variability during reaching movements in primates. **Journal of Neuroscience** 25(46):10712-10716.
26. Lebedev M.A., **Carmena J.M.**, O'Doherty J.E., Zacksenhouse M., Henriquez C.S., Principe J.C. and Nicolelis M.A.L. (2005) Cortical ensemble adaptation to represent velocity of an artificial actuator controlled by a brain-machine interface. **Journal of Neuroscience** 25(19):4681-4693.
27. **Carmena J.M.** and Hallam J.C.T. (2004) Narrowband tracking using a biomimetic sonarhead. **Robotics and Autonomous Systems** 46(4), pp. 247-259.
28. Patil P.G., **Carmena J.M.**, Nicolelis M.A.L. and Turner D.A. (2004) Ensembles of human subcortical neurons as a source of motor control signals for a brain-machine interface. **Neurosurgery** 55(1), pp. 27-38.
29. Sanchez J.C., **Carmena J.M.**, Lebedev M.A., Nicolelis M.A.L., Harris J.G. and Principe J.C. (2004) Ascertaining the importance of neurons to develop better brain-machine interfaces, **IEEE Transactions on Biomedical Engineering** 51(6), pp. 943-953.
30. Bossetti C.A., **Carmena J.M.**, Nicolelis M.A.L. and Wolf P.D. (2004) Transmission latencies in a telemetry-linked brain-machine interface. **IEEE Transactions on Biomedical Engineering** 51(6), pp. 919-924.
31. **Carmena J.M.** and Hallam J.C.T. (2004) The use of Doppler in Sonar-based mobile robot navigation: inspirations from Biology. **Information Sciences** 161(1-2), pp. 71-94.
32. **Carmena J.M.**, Lebedev M.A., Crist R.E., O'Doherty J.E., Santucci D.M., Dimitrov D.F., Patil P.G., Henriquez C.S. and Nicolelis M.A.L. (2003) Learning to control a brain-machine interface for reaching and grasping by primates. **PLoS Biology** 1(2), pp. 193-208.
33. Nicolelis M.A.L., Dimitrov D., **Carmena J.M.**, Crist R.E., Lehew G., Kralik J. and Wise S.P. (2003) Chronic, multi site, multi electrode recordings in macaque monkeys. **Proceedings of the National Academy of Sciences** 100(19), pp. 11041-11046.
34. **Carmena J.M.** and Hallam J.C.T. (2002) Estimating Doppler-shift using Bat-inspired Cochlear Filterbank Models: A Comparison of Methods for Echoes from Single and Multiple Reflectors. **Adaptive Behavior**. 9(3-4), pp.241-261.
35. **Carmena J.M.**, Kämpchen N., Kim D., and Hallam J.C.T. (2001) Artificial ears for a biomimetic sonarhead: from multiple reflectors to surfaces. **Artificial Life**, 7(2), pp.147-169.

Peer-Reviewed Conference Proceedings and Book Chapters

1. Koralek A.C. and **Carmena J.M.** (2012) BMI learning results in highly precise cell-specific coherence in corticostriatal networks. Computational and Systems Neuroscience (COSYNE), Salt Lake City (UT).

2. So K., Gastpar M. and **Carmena J.M.** (2012) An objective approach to learning movement-related features from local field potentials. Computational and Systems Neuroscience (COSYNE), Salt Lake City (UT).
3. So K., Gastpar M. and **Carmena J.M.** (2011) Assessing directed information as a method for inferring functional connectivity in neural ensembles. Proceedings of EMBC'11, 33rd Annual International Conference of the IEEE Engineering in Medicine and Biology Society, Boston (MA).
4. Orsborn* A.L., Dangi* S., Moorman H.G. and **Carmena J.M.** (2011) Exploring time-scales of closed-loop decoder adaptation in brain-machine interfaces. Proceedings of EMBC'11, 33rd Annual International Conference of the IEEE Engineering in Medicine and Biology Society, Boston (MA).
5. So K., Ganguly K., Gastpar M. and **Carmena J.M.** (2011) Redundant information encoding in primary motor cortex during motor task. 5th International IEEE EMBS Conference on Neural engineering. Cancun (Mexico).
6. Dangi S., Gowda S., Heliot R. and **Carmena J.M.** (2011) Adaptive Kalman filtering for closed-loop brain-machine interface systems. 5th International IEEE EMBS Conference on Neural Engineering. Cancun (Mexico).
7. Cadieu C., Canolty R., Ganguly K., Barbaro N., Knight R.K. and **Carmena J.M.** and Koepsell K. (2011) A phase-amplitude coupled latent variable model applied to dynamical brain states. Computational and Systems Neuroscience (COSYNE), Salt Lake City (UT).
8. So K., Ganguly K., Gastpar M. and **Carmena J.M.** (2011) Functional connectivity in the primary motor cortex during motor tasks. Computational and Systems Neuroscience (COSYNE), Salt Lake City (UT).
9. Zacksenhouse M., Lebedev M., **Carmena J.M.** and Nicolelis M.A.L. (2011) Spike-count analysis reveals the relevant timescales in experiments with brain-machine interfaces. Computational and Systems Neuroscience (COSYNE), Salt Lake City (UT).
10. Koralek A.C., Long J.D., Costa R.M. and **Carmena J.M.** (2010) Corticostriatal dynamics during learning and performance of a neuroprosthetic task. Proceedings of EMBC'10, 32nd Annual International Conference of the IEEE Engineering in Medicine and Biology Society, Buenos Aires (Argentina).
11. Heliot R., Venkatraman S. and **Carmena J.M.** (2010) Decoder remapping to counteract neuron loss in brain-machine interfaces. Proceedings of EMBC'10, 32nd Annual International Conference of the IEEE Engineering in Medicine and Biology Society, Buenos Aires (Argentina).
12. Mark M., Bjorninen T., Chen Y.D., Venkatraman S., Ukkonen L., Sydanheimo L., **Carmena J.M.** and Rabaey J.M. (2010) Wireless channel characterization for mm-size neural implants. Proceedings of EMBC'10, 32nd Annual International Conference of the IEEE Engineering in Medicine and Biology Society, Buenos Aires (Argentina).
13. Canolty R.T., Ganguly K., Kennerley S.W., Cadieu C.F., Koepsell K., Wallis J.D. and **Carmena J.M.** (2010) Single-neuron spike timing depends on global brain dynamics. Computational and Systems Neuroscience 2010. doi: 10.3389/conf.fnins.2010.03.00264
14. Heliot R. and **Carmena J.M.** (2009) A model of motor learning in brain-machine interfaces: predicting neural tuning changes. IEEE Systems, Man and Cybernetics Conference, San Antonio, TX.

15. Jimenez J., Heliot R. and **Carmena J.M.** (2009) Learning to use a brain-machine interface: model, simulation and analysis. Proceedings of EMBC'09, 31st Annual International Conference of the IEEE Engineering in Medicine and Biology Society, Minneapolis, MN.
16. Venkatraman S., Patten C. and **Carmena J.M.** (2009) Exploiting the 1/f structure of neural signals for the design of integrated neural amplifiers. Proceedings of EMBC'09, 31st Annual International Conference of the IEEE Engineering in Medicine and Biology Society, Minneapolis, MN. [*Finalist, Student Paper Competition*]
17. Heliot R., Ganguly K. and **Carmena J.M.** (2009) Modeling and experimental validation of the learning process during closed-loop BMI operation. International Conference on Machine Learning and Cybernetics, Baoding (China). [*Lotfi Zadeh Best Conference Paper Award*]
18. Venkatraman S., Hendricks J., Richardson-Burns S., Jan E., Martin D.C. and **Carmena J.M.** (2009) PEDOT coated microelectrode arrays for chronic neural recording and stimulation. 4th International IEEE EMBS Conference on Neural engineering. Antalya (Turkey).
19. Ranade G.V., Ganguly K. and **Carmena J.M.** (2009) LFP beta power predicts cursor stationarity in BMI task. 4th International IEEE EMBS Conference on Neural engineering. Antalya (Turkey).
20. Heliot R., Orsborn A. and **Carmena J.M.** (2008) Stiffness control of 2-DOF exoskeleton for brain-machine interfaces. 2nd IEEE RAS / EMBS International Conference on Biomedical Robotics and Biomechatronics, Scottsdale (AZ).
21. Ganguly K., Torres E.B., Jose J.V. and **Carmena J.M.** (2008) From multiple neural cortical networks to motor mechanical behavior: the importance of inherent learning over separable space-time length scales. 7th Annual Computational Neuroscience Meeting, Portland, OR. BMC Neuroscience **9** (Suppl 1):P70.
22. Venkatraman S., Long J.D., Pister K.S.J. and **Carmena J.M.** (2007) Wireless inertial sensors for monitoring animal behavior. Proceedings of EMBC'07, 29th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, Lyon (France).
23. Kim S.P., **Carmena J.M.**, Nicolelis M.A.L. and Principe J.C. (2005) Multiresolution representations and data mining of neural spikes for brain-machine interfaces. Proc. of the 2nd International Conference on Neural Engineering, Arlington, VA (USA).
24. Rao Y.N., Kim S.P., Sanchez J.C., Erdogomus D., Principe J.C., **Carmena J.M.**, Lebedev M.A. and Nicolelis M.A.L. (2005) Learning mappings in BMIs with echo state networks. Proc. of the IEEE-ICASSP, Philadelphia, PA (USA).
25. Sanchez J.C., Principe J.C., **Carmena J.M.**, Lebedev M.A. and Nicolelis M.A.L. (2004) Simultaneous predictions of four kinematic variables for a BMI using a single recurrent neural network. 26th Int. Conf. of the IEEE-EMBS, San Francisco, CA (USA).
26. **Carmena J.M.** and Hallam J.C.T. (2002) Narrowband 3D tracking using a biomimetic sonarhead. Proceedings of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), Lausanne (Switzerland).
27. **Carmena J.M.** and Hallam J.C.T. (2001) A comparison of methods for estimating Doppler shift using cochlear filterbank models. European workshop on advanced mobile robots (EUROBOT), pp. 9-16, Lund (Sweden). [*Best Conference Paper Award*]

28. **Carmena J.M.** and Hallam J.C.T. (2001) Exploiting the physics: Doppler-based navigation with a bat-inspired mobile robot. Proceedings of the 9th Symposium on Intelligent Robotic Systems, pp. 467-476, Toulouse (France).
29. **Carmena J.M.** and Hallam J.C.T. (2001) A Doppler-based motion controller for an echolocating mobile robot, Towards Intelligent Mobile Robots. Technical Report Series, Dept. of Computer Science, Manchester University, Manchester (UK). ISSN 1361 6161.
30. Peremans H., Müller R., **Carmena J.M.** and Hallam J.C.T. (2000) A biomimetic platform to study perception in bats. Proceedings of SPIE: Sensor Fusion and Decentralized Control in Robotics Systems III, Vol 4196, pp. 168-179, Boston, MA (USA).
31. **Carmena J.M.**, Kim D., and Hallam J.C.T. (2000) Designing artificial ears for animal echolocation. From Animals to Animats 6. pp.73-80, J-A. Meyer et al. (Eds.), MIT Press.
32. **Carmena J.M.** and Hallam J.C.T. (2000) Estimating Doppler shift with a coarse cochlear filterbank. Proceedings of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), Vol 1, pp. 221-226, Takamatsu (Japan).
33. Kim D., **Carmena J.M.** and Hallam J.C.T. (2000) Towards an artificial pinna for a narrow band biomimetic sonarhead. Lecture Notes in Computer Science 1801, pp. 113-122, Miller et al. (Eds.), Springer-Verlag.
34. **Carmena J.M.** and Hallam J.C.T. (1999) Improving performance in a multi-robot task through minimal communication. Proceedings of the 7th Symposium on Intelligent Robotic Systems, pp. 329-337, Coimbra (Portugal).

Review Articles and Book Chapters by Invitation

1. **Carmena J.M.** (2012) Becoming Bionic. **IEEE Spectrum**, 49(3), pp. 24-29. [Online version appeared as 'How to control a prosthesis with your mind'].
2. Sanchez J.C., Lytton W.W., **Carmena J.M.**, Principe J.C., Fortes, J., Barbour R.L. and Francis J.T. (2012) Dynamically repairing and replacing neural networks: using hybrid computational and biological tools. **IEEE Pulse**, 3(1), pp. 57-59.
3. Millan J.R. and **Carmena J.M.** (2010) Conversations in BME – invasive or noninvasive: understanding brain-machine interface technology. **IEEE Engineering in Medicine and Biology Magazine**, 29(1), pp. 16-22.
4. **Carmena J.M.** and Cohen L.G. (2010) Brain-machine interfaces and transcranial stimulation – future implications for spinal injury in humans. **Spinal Cord Injuries: Handbook of Clinical Neurology series**, 3rd edition. M.J. Aminoff et al. editors, Elsevier (in press).
5. Heliot R. and **Carmena J.M.** (2010) Brain-machine interfaces. **Encyclopedia of Behavioral Neuroscience**, In: Koob G.F., Le Moal M. and Thompson R.F. (eds.) Encyclopedia of Behavioral Neuroscience, volume 1, pp. 221–225 Oxford: Academic Press.
6. Micera S. and **Carmena J.M.** (2009) Editorial: Developing the Next Generation of Hybrid Neuroprosthetic Systems. **IEEE Transactions on Biomedical Engineering** 56(1), pp. 3-5.
7. **Carmena J.M.** (2008) Cortical control of neuroprosthetic devices. **Wearable robots: biomechatronic exoskeletons**, pp. 115-118. J.L. Pons editor. John Wiley and Sons.
8. **Carmena J.M.** and Nicoletis M.A.L. (2005) Advances in Brain-Machine Interfaces. **Motor**

- Cortex in Voluntary Movements**, pp. 349-366, A. Riehle and E. Vaadia (Eds.), CRC Press.
9. **Carmena J.M.** (2005) Brain-machine interfaces: a novel paradigm for the study of learning and adaptation. **Artificial Intelligence and Simulation of Behaviour Quarterly**, 122, pp. 3-4.
 10. **Carmena J.M.** (2004) Brain Versus Machine Control. **PLoS Biology** 2(12), pp.5-6, e430.
 11. **Carmena J.M.** (2001) Report of the IROS 2000 conference. **Artificial Intelligence and Simulation of Behaviour Quarterly**, 105, pp.11-12, ISSN 0268 4179.
 12. **Carmena J.M.** and Domingo J. (1998). Artificial Intelligence: A panoramic view. **Boletín de Psicología**, 59, pp. 21-47. ISSN 0212 8179.

Abstracts

1. Orsborn A.L., Dangi S., Moorman H. and **Carmena J.M.** (2011) Closed-loop decoder adaptation on intermediate time-scales facilitates rapid BMI performance improvements independent of decoder initialization. 41st Annual Meeting of the Society for Neuroscience, Washington (DC).
2. Koralek A.C. and **Carmena J.M.** (2011) The development of highly precise temporal dynamics in corticostriatal networks during learning. 41st Annual Meeting of the Society for Neuroscience, Washington (DC).
3. Canolty R.T., Ganguly K., Cadieu C.F., Koepsell K. and **Carmena J.M.** (2011) Reversible, task-dependent changes in the coupling of spike timing to distributed LFP patterns. 41st Annual Meeting of the Society for Neuroscience, Washington (DC).
4. Long J.D. and **Carmena J.M.** (2010) Dynamic Changes of Rodent Somatosensory Barrel Cortex are Correlated with Learning a Novel Conditioned Stimulus. 40th Annual Meeting of the Society for Neuroscience, San Diego (CA).
5. Koralek A., Jin X., Costa R.M. and **Carmena J.M.** (2010) The role of corticostriatal dynamics in learning to operate a brain-machine interface. 40th Annual Meeting of the Society for Neuroscience, San Diego (CA).
6. Overduin S.A., d'Avella A., **Carmena J.M.** and Bizzi E. (2010) Hand movements and muscle activation evoked by intracortical microstimulation 40th Annual Meeting of the Society for Neuroscience, San Diego (CA).
7. Torres E.B., Ganguly K., Jose J.V. and **Carmena J.M.** (2010) Directional and temporal selectivity in motor cortex. 40th Annual Meeting of the Society for Neuroscience, San Diego (CA).
8. Ganguly K. and **Carmena J.M.** (2010) Large-scale rescaling of cortical networks during neuroprosthetic control. Brain-Computer Interface meeting, Asilomar, Monterey (CA).
9. Ganguly K. and **Carmena J.M.** (2010) Neural adaptations to a brain-machine interface. Annual meeting of the Neural Control of Movement Society, Naples (FL).
10. Carmena J.M., Canolty R.T. and Gastpar M.C. (2009) Applying information theoretic measures to computation and communication in neural ensembles. In Proc. 43rd Annual IEEE Asilomar Conference on Signals, Systems, and Computers, Monterey (CA).

11. Ganguly K. and **Carmena J.M.** (2009) Neural mechanisms underlying the changes in directional tuning in brain-machine interfaces. 39th Annual Meeting of the Society for Neuroscience, Chicago (IL).
12. Orsborn A.L. and **Carmena J.M.** (2009) Neural correlates of dynamic limb stiffness modulation in an accuracy constraint task. 39th Annual Meeting of the Society for Neuroscience, Chicago (IL).
13. Venkatraman S. and **Carmena J.M.** (2009) Encoding the location of virtual objects using cortical microstimulation. 39th Annual Meeting of the Society for Neuroscience, Chicago (IL).
14. Canolty R.T., Kennerley S.W., Ganguly K., Wallis J.D. and **Carmena J.M.** (2009) Spikes from single neurons can depend on global brain state. 39th Annual Meeting of the Society for Neuroscience, Chicago (IL).
15. Long J.D. and **Carmena J.M.** (2009) Learning a response to intracortical microstimulation of rat primary somatosensory cortex is correlated with changes in local neural ensemble activity. 39th Annual Meeting of the Society for Neuroscience, Chicago (IL).
16. **Carmena J.M.**, Ranade G. and Ganguly K. (2008) Ensemble representation of movement parameters in motor cortex during center-out reaches with the ipsilateral arm. 38th Annual Meeting of the Society for Neuroscience, Washington (DC).
17. Ganguly K. and **Carmena J.M.** (2008) Performance variability with linear filters for brain-machine interfaces. 38th Annual Meeting of the Society for Neuroscience, Washington (DC).
18. Ganguly K., Torres E.B., Jose J.V. and **Carmena J.M.** (2008) From multiple neural cortical networks to motor mechanical behavior: The importance of inherent learning over separable space-time length scales. Seventeenth Annual Computational Neuroscience (CNS) Meeting Portland (OR).
19. **Carmena J.M.** (2008) Towards cortical control of wearable neuroprostheses. IEEE International Conference on Robotics and Automation; Workshop on Wearable robots. Pasadena (CA).
20. Venkatraman S., Long J.D. and **Carmena J.M.** (2007) Electrochemical constraints for intracortical microstimulation used in neuroprosthetic applications. 37th Annual Meeting of the Society for Neuroscience, San Diego (CA).
21. Long J.D., Venkatraman S. and **Carmena J.M.** (2007) A platform for studying the effects of plasticity upon the learning of intracortical microstimulation induced percepts. 37th Annual Meeting of the Society for Neuroscience, San Diego (CA).
22. Venkatraman S., Long J.D. and **Carmena J.M.** (2007) Biophysics of Intracortical Microstimulation: Electrochemical Constraints. BMES Fall Meeting, Los Angeles (CA).
23. Long J.D. and **Carmena J.M.** (2007) Multi-site, multi-electrode recording and microstimulation in behaving rats for the determination of sensorimotor transforms. 10th Tamagawa-Riken Dynamic Brain Forum, Hakuba (Japan).
24. Zacksenhouse M., Lebedev M.A., **Carmena J.M.**, O'Doherty J.E., Henriquez C.S. and Nicolelis M.A.L. (2005) Trends in firing rate statistics mirroring changes in task performance during training with BMIs. Society for Neuroscience 35th Annual Meeting, Washington (DC).

25. Hanson T.L., **Carmena J.M.**, Phelps E.E. and Nicolelis M.A.L. (2005) A suite of hardware and software for clinical brain-machine interfaces. Society for Neuroscience 35th Annual Meeting, Washington (DC).
26. Oliveira L.M., Fitzsimmons N.A., Hanson T.L., **Carmena J.M.**, Sandler A.J. and Nicolelis M.A.L. (2005) Learning intracortical microstimulation as a cue for a discrimination task. Society for Neuroscience 35th Annual Meeting, Washington (DC).
27. **Carmena J.M.**, Hanson T.L., Kim H.K. and Nicolelis M.A.L. (2005) Predicting arm dynamics from cortical ensemble activity in primates via a musculoskeletal model. Society for Neuroscience 35th Annual Meeting, Washington (DC).
28. **J.M. Carmena**, M.A. Lebedev, E.E. Phelps, K.S. Dewey and M.A.L. Nicolelis (2004) Neuronal variability across cortical ensembles in macaque monkeys during performance of motor task. Society for Neuroscience 34th Annual Meeting, San Diego (CA).
29. P.G. Patil, **J.M. Carmena**, M.A.L. Nicolelis and D.A. Turner (2004) Ensemble recordings of human subcortical neurons as a source of motor control signals for a brain-machine interface. Society for Neuroscience 34th Annual Meeting, San Diego (CA).
30. R. Gutierrez, **J.M. Carmena**, M.A.L. Nicolelis and S.A. Simon (2004) Orbitofrontal neuronal activity can predict the initiation of a goal-directed behavior involving licking for a reward. Society for Neuroscience 34th Annual Meeting, San Diego (CA).
31. M.A. Lebedev, J.E. O'Doherty, M. Zacksenhouse, **J.M. Carmena**, C.S. Henriquez and M.A.L. Nicolelis (2004) Directional tuning in neuronal populations. Society for Neuroscience 34th Annual Meeting, San Diego (CA).
32. H.K. Kim, S.J. Biggs, D.W. Schloerb, **J.M. Carmena**, M.A. Lebedev, M.A.L. Nicolelis and M.A. Srinivasan. (2004) Continuous shared control of an assistive robot with primate neural signals. Society for Neuroscience 34th Annual Meeting, San Diego (CA).
33. L. Santos, **J.M. Carmena**, L.M.O. Oliveira, S. Ribeiro and M.A.L. Nicolelis (2004) Neuronal ensemble activity in the primary motor cortex predicts multiple muscular movements in the rat. Society for Neuroscience 34th Annual Meeting, San Diego (CA).
34. M. Zacksenhouse, M.A. Lebedev, J.E. O'Doherty, **J.M. Carmena**, C.S. Henriquez and M.A.L. Nicolelis (2004) Cortical neurons tuning to multiple spatio-temporal patterns of movement. Society for Neuroscience 34th Annual Meeting, San Diego (CA).
35. J.E. O'Doherty, G.S. Hugh, M. Zacksenhouse, M.A. Lebedev, **J.M. Carmena**, C.S. Henriquez and M.A.L. Nicolelis (2004) Simulation of a brain-machine interface in a model sensorimotor system. Society for Neuroscience 34th Annual Meeting, San Diego (CA).
36. J.E. O'Doherty, D.S. Won, M. Zacksenhouse, M.A. Lebedev, **J.M. Carmena**, M.A.L. Nicolelis, P.D. Wolf and C.S. Henriquez (2004) Data reduction of simultaneous multi-electrode neural recordings using principal component analysis. Annual fall meeting of the Biomedical Engineering Society, Philadelphia (PA).
37. M. Zacksenhouse, M.A. Lebedev, J.E. O'Doherty, **J.M. Carmena**, C.S. Henriquez and M.A.L. Nicolelis (2004) Operation of brain-machine interface increases the variance and degree of correlation in fronto-parietal cortical activity. International Conference on Cognitive and Neural Systems, Boston, MA (USA).

38. **J.M. Carmena** and M.A.L. Nicolelis (2004) Closed-loop brain-machine interfaces for restoring motor functions: experiments in rhesus macaques and humans. Christopher Reeve Paralysis Foundation Spinal Cord Symposium, Oak Brook Hills, IL (USA).
39. **J.M. Carmena**, M.A. Lebedev, E.E. Phelps and M.A.L. Nicolelis (2004) Cell variability across fronto-parietal cortical ensembles in macaque monkeys: implications for neuroprosthetic design. 1st Neuroscience Symposium, International Institute for Neuroscience of Natal (Brazil).
40. L.M.O. Oliveira, L. Santos, **J.M. Carmena**, A. Pereira, S. Ribeiro and M.A.L. Nicolelis (2004) Prediction of whisker movements from neuronal ensemble recordings in the primary motor cortex of rats. 1st Neuroscience Symposium, International Institute for Neuroscience of Natal (Brazil).
41. **J.M. Carmena**, M.A. Lebedev, J.E. O'Doherty, C.S. Henriquez and M.A.L. Nicolelis (2003) Fronto-parietal reorganization underlies incorporation of robot dynamics by the primate cortex during operation of a reaching and grasping brain-machine interface. Society for Neuroscience 33rd Annual Meeting, New Orleans (LA).
42. M.A. Lebedev, **J.M. Carmena**, J.E. O'Doherty, C.S. Henriquez and M.A.L. Nicolelis (2003) Directional tuning of frontal and parietal neurons during operation of a brain-machine interface. Society for Neuroscience 33rd Annual Meeting, New Orleans (LA).
43. M.A.L. Nicolelis, D. Dimitrov, **J.M. Carmena**, R.E. Crist, G. Lehew, J.D. Kralik and S.P. Wise (2003) Chronic, multisite, multielectrode recordings in macaque monkeys. Society for Neuroscience 33rd Annual Meeting, New Orleans (LA).
44. D.M. Santucci, J.D. Kralik, **J.M. Carmena**, M.A. Lebedev and M.A.L. Nicolelis (2003) EMG prediction from multisite, multielectrode recordings in new world monkeys and rhesus macaques. Society for Neuroscience 33rd Annual Meeting, New Orleans (LA).
45. J.E. O'Doherty, **J.M. Carmena**, M.A. Lebedev, M.A.L. Nicolelis and C.S. Henriquez (2003) A random-walk analysis for the evaluation and design of motor control tasks. Annual fall meeting of the Biomedical Engineering Society, New Orleans (LA).
46. R.E. Crist, **J.M. Carmena**, J. Wessberg and M.A.L. Nicolelis (2002) Sensory feedback for a real-time control of a robotic device based on cortical ensemble recordings from primate cortex. Society for Neuroscience 32nd Annual Meeting, Orlando (FL).
47. S. Ribeiro, D. Gervasoni, R.E. Crist, E.S. Soares, **J.M. Carmena**, J.Zhou, J. Pantoja, D.J. Krupa and M.A.L. Nicolelis (2002) Effects of experience on brain activity during wakefulness and sleep in rats. Society for Neuroscience 32nd Annual Meeting, Orlando (FL).
48. **J.M. Carmena** and J.C.T. Hallam (2000) Doppler shift based navigation for mobile robots. Proceedings of the Workshop on Biomimetic Ultrasound, p.13, Edinburgh (Scotland).
49. **J.M. Carmena** and J.C.T. Hallam (1999) A robotic platform for investigating the usage of acoustic flow in cf-bats. 138th Meeting of the Acoustical Society of America, Columbus, Ohio. J. Acoust. Soc. America Vol 106(4) p. 2192.
50. **J.M. Carmena** and J.C.T. Hallam (1999) The role of pinna motion in cf-bats: Experiments with a robotic model. Proceedings of the Workshop Biomechanics meets Robotics: Modelling and Simulation of Motion, pp. 42, Heidelberg (Germany).
51. **J.M. Carmena** and J.C.T. Hallam (1999) Using bat biosonar as a biological approach for mobile robot navigation. Proceedings of the Workshop on Biologically-inspired Machine Learning, ACAI'99, pp. 48-50, Crete (Greece).

Edited Proceedings

1. Proceedings of the IWINAC Workshop on Robotics and Neurobiology. A. del Pobil, **J.M. Carmena** and Y. Demiris editors. Las Palmas de G. Canaria (Spain) 2005.
2. Proceedings of the SAB'02-Workshop on Motor Control in Humans and Robots: on the interplay of real brains and artificial devices. **J.M. Carmena** and G. Maistros editors. University of Edinburgh, 2002.
3. Proceedings of the Workshop on Biomimetic Ultrasound. **J.M. Carmena**, R. Müller, H. Peremans and J.C.T. Hallam editors. University of Edinburgh, 2000.

Dissertations

- **Carmena J.M.** (2001) Towards a bionic bat: A biomimetic investigation of active sensing, Doppler-shift estimation, and ear morphology design for mobile robots. **Ph.D. thesis**, University of Edinburgh (Scotland, UK).
- **Carmena J.M.** (1998) Cooperative tasks need versatile inter-robot communication systems? **M.S. thesis**, Dept. of Artificial Intelligence, U. of Edinburgh (Scotland, UK).
- **Carmena J.M.** (1997) Design and implementation of a microcontroller-based communication protocol: Applications to mobile robots. **M.S. thesis**, Department of Electronics Engineering, School of Physics, University of Valencia (Spain).

Featured Articles in the Press

- ❖ **Referenced Article:** Canolty R.T., Ganguly K., Kennerley S.W., Cadieu C.F., Koepsell K., Wallis J.D. and **Carmena J.M.** (2010) Oscillatory phase coupling coordinates anatomically-dispersed functional cell assemblies. *Proceedings of the National Academy of Sciences* doi: 10.1073/pnas. 1008306107. **Featured in:** Word Press, ScienceDaily, El Mundo.
- ❖ **Referenced Article:** Ganguly K. and **Carmena J.M.** (2009) Emergence of a stable cortical map for neuroprosthetic control. *PLoS Biology* 7(7), e1000153. doi:10.1371/journal.pbio.1000153. **Featured in:** New York Times, IEEE Spectrum, Technology Review, Communications of the ACM, The Scientist, New Scientist, El Mundo, El Pais.
- ❖ **Referenced Article:** **Carmena J.M.**, Lebedev M.A., Crist R.E., O'Doherty J.E., Santucci D.M., Dimitrov D.F., Patil P.G., Henriquez C.S. and Nicolelis M.A.L. (2003) Learning to control a brain-machine interface for reaching and grasping by primates. *PLoS Biology* 1(2): e42 DOI: 10.1371/journal.pbio.0000042. **Featured in:** Time, The Economist, New York Times, Washington Post, Popular Science, New Scientist, The Times (UK), Independent (UK), The Guardian (UK), Associated Press.
- ❖ **Referenced Article:** **Carmena J.M.**, Kim D. and Hallam J.C.T. (2000) Designing artificial ears for animat echolocation. From Animals to Animats 6. *Proceedings 6th Int. Conf. on Simulation of Adaptive Behavior*, pp. 73-80, J-A. Meyer *et al.* (Eds.), MIT Press. **Featured in:** New Scientist, The Times (UK), Edinburgh Evening News (UK), Focus (EU).

Invited Talks & Guest Lectures

1. Seminar series, **Instituto Cajal-CSIC**, Madrid (Spain), March 2012.
2. Invited speaker, Tecnalia, San Sebastian (Spain), February 2012.
3. Opening Lecture, 8th Christmas Meeting, **Instituto de Neurociencias**, Alicante (Spain), December 2011.
4. BME Seminar Series, Department of Biomedical Engineering, **Johns Hopkins University**, Baltimore (MD), November 2011.
5. IEEE-SMC 3rd annual Workshop on Brain-Machine Interfaces, Anchorage (AK), October 2011.
6. Grand Rounds, Department of Neurosurgery, **University of California, San Francisco (CA)**, August 2011.
7. CRCNS Berkeley Summer Course in Mining and Modeling of Neuroscience Data, **University of California, Berkeley (CA)**, July 2011.
8. International Joint Conference on Neural Networks (IJCNN) Symposium, From Brains to Machines, San Jose (CA), July 2011.
9. 8th Annual World Congress of IBMISPS on Brain, Spinal Cord Mapping & Image Guided Therapy, San Francisco (CA), June 2011.
10. Neurocolloquium, **Max Planck Institute/University of Tuebingen**, Tuebingen (Germany), May 2011.
11. College Student Interest Group in Neurology (Co-SIGN), Mind Over Matter Conference, **Stanford University**, Palo Alto (CA), May 2011.
12. Department of Electrical Engineering Seminar Series, **University of California, Los Angeles, (CA)**, May 2011.
13. Neuroscience Programme Seminar Series. **Champalimaud, Centre for the Unknown**. Lisbon (Portugal), March 2011.
14. Departamento de Neurociencias, **Universidad Autonoma de Madrid**, Madrid (Spain), March 2011.
15. Cosyne Workshop on Emerging Systems Theories in BMI Neuroscience. Snowbird, Salt Lake City (UT), February 2011.
16. Social Science Colloquium series, "Emerging Minds: Seeking Meaning in a Physical World." **Bucknel University**, Lewisburg (PA), February 2011.
17. School of Biological and Health Systems seminar, **Arizona State University**, Tempe (AZ), February 2011.
18. Bioengineering Department seminar, **University of Pittsburgh**, Pittsburgh (PA), February 2011.
19. Grupo de Bioingenieria, **Consejo Superior de Investigaciones Cientificas (CSIC)**, Madrid (Spain), November 2010.
20. Automatic Control Laboratory, **Swiss Federal Institute of Technology (ETH)**, Zurich (Switzerland), November 2010.
21. CNS Workshop on 'Computational models for movement control and adaptation during BMI operation', San Antonio (TX), July 2010.
22. US-Turkey Advanced Study Institute on Global Healthcare Challenges, Antalya (Turkey), July 2010.
23. AREADNE - Research in Encoding and Decoding of Neural Ensembles. Santorini (Greece), June 2010.
24. CMOS Emerging Technologies Workshop, Whistler, British Columbia (Canada), May 2010.
25. Panel Session on Decoding from Neural Ensembles. Annual Meeting of the Society for the Neural Control of Movement, Naples (FL), April 2010.
26. Beyond Neural Cartography Workshop, **University of Southern California**, Los Angeles (CA), March 2010.
27. Invited Speaker, Facultad de Informatica, **Universidad de Murcia** (Spain), March 2010.
28. Guest lecture (host: Dr. Krishna Shenoy), **Stanford University**, Palo Alto (CA), March 2010.
29. Werkgemeenschap voor Informatie- en Communicatietheorie (WIC) Winter Meeting, **Technische Universiteit Eindhoven** (The Netherlands), February 2010.
30. **Keynote speaker**. Tools for Brain-Computer Interaction (TOBI) Workshop, Graz (Austria),

- February 2010.
31. International Symposium on Neurorehabilitation, Valencia (Spain), October 2009.
 32. Tutorial on brain-machine interfaces, IEEE Systems, Man and Cybernetics conference, San Antonio (TX), October 2009.
 33. Neuroscience seminar (hosted by Dr. Bence Ölveczky), Department of Organismic and Evolutionary Biology, **Harvard University**, September 2009.
 34. UCB/UCSF Graduate Program in Bioengineering retreat, Lake Tahoe (CA), September 2009.
 35. **National Science Foundation**, Neuromechanics workshop, September 2009.
 36. Army Research Office Workshop "Beyond Brain-Machine Interface", IEEE Engineering in Medicine and Biology Conference, Minneapolis (MN), September 2009.
 37. **Keynote speaker**. International Conference on Machine Learning and Cybernetics, Baoding (China), July 2009.
 38. **Instituto de Neurociencias**, CSIC-Universidad Miguel Hernandez, San Juan, Spain, June 2009.
 39. Distinguished lecture. Royal Academy of Medicine and Surgery, Murcia, Spain, June 2009.
 40. **Keynote speaker**. Simposio CEA de Bioingenieria: Tecnicas de BCI. **Universidad Miguel Hernandez**, Elche, Spain, June 2009.
 41. Satellite Workshop. Annual Meeting of the Society for the Neural Control of Movement. Waikoloa (HI), April 2009.
 42. McGovern Institute Seminar (hosted by Dr. Emilio Bizzi), **Massachusetts Institute of Technology**, Cambridge (MA), January 2009.
 43. Nanotechnology as an Enabler for Neuroscience, Neuroengineering and Neural Prostheses Workshop. **Stanford University**, Palo Alto (CA), December 2008.
 44. Bio-E* Series. **University of California, Berkeley** (CA), October 2008.
 45. Workshop on Environmental and BioMedical Monitoring Microsystems, BSAC, **University of California, Berkeley** (CA), September 2008.
 46. Neuro-inspired and Neuro-applied Computing Workshop, Gigascale Systems Research Center, Berkeley (CA), August 2008.
 47. NIH, **National Institute on Alcohol Abuse and Alcoholism**, Section on In Vivo Neural Function, Bethesda (MD), June 2008.
 48. NIH, **National Institute of Neurological Disorders and Stroke**, Human Cortical Physiology Section, Bethesda (MD), June 2008.
 49. IEEE-ICRA Workshop in wearable robots, Pasadena (CA), June 2008.
 50. Catedra de Informatica y Salud. **Universidad Politecnica de Valencia** (Spain), June 2008.
 51. Real-time brain interfacing applications workshop, Columbus (OH), May 2008.
 52. 2nd Annual Berkeley Conference on Translational Research, **University of California, Berkeley** (CA), April 2008.
 53. Computer Science and Engineering Department, **University of Washington**, Seattle (WA), February 2008.
 54. Berkeley Wireless Research Center (BWRC) winter retreat, Monterey, CA, January 2008.
 55. **Keynote speaker**. Brain Computer Interface Workshop, The MAIA project. Leuven (Belgium), November 2007.
 56. Cognitive Computing Workshop, **University of California, Berkeley** (CA), May 2007.
 57. Berkeley Initiative in Soft Computing (BISC) group, **University of California, Berkeley** (CA), February 2007.
 58. **Keynote speaker**. Brain Computer Interface Workshop, The MAIA project. Rome (Italy), November 2006.
 59. Pierce Community College, Los Angeles (CA), November 2006.
 60. Bay Area Signals, Information and Control Symposium, **University of California, Berkeley** (CA), June 2006.
 61. Grand Rounds, Department of Neurosurgery, **University of California, San Francisco** (CA), June 2006.
 62. Redwood Center for Theoretical Neuroscience, **University of California, Berkeley** (CA), October 2005.
 63. Guest lecture (hosted by Dr. John Canny). Department of Electrical Engineering and Computer Science, **University of California, Berkeley** (CA), October 2005.

64. Epstein Laboratory, Department of Otolaryngology, **University of California, San Francisco** (CA), October 2005.
65. Department of Bioengineering, **Stanford University**, Palo Alto (CA), May 2005.
66. Alfred E. Mann Foundation for Biomedical Engineering, Valencia (CA), May 2005.
67. Department of Biomedical Engineering, **University of Southern California**, Los Angeles (CA), May 2005.
68. Department of Electrical Engineering and Computer Science, **University of California, Berkeley** (CA), April 2005.
69. Depart. of Biomedical Engineering, **University of Minnesota**, Minneapolis (MN), April 2005.
70. Cosyne Workshop on Emerging Directions in Cortical Brain-Machine Interfaces for Control. Snowbird, Salt Lake City (UT), March 2005.
71. Sensorimotor Program, Rehabilitation Institute of Chicago, **Northwestern University Medical School**, Chicago (IL), March 2005.
72. Department of Biomedical Engineering, **Northwestern University**, Evanston (IL), March 2005.
73. School of Biomedical Engineering, Science and Health Systems, **Drexel University**, Philadelphia (PA), March 2005.
74. Department of Neurobiology and Anatomy, **Drexel University**, Philadelphia (PA), March 2005.
75. Inst. of Cognitive and Brain Sciences, **University of California, Berkeley** (CA), March 2005.
76. Department of Biomedical Eng., **Rutgers University**, Piscataway (NJ), Feb. 2005.
77. Guest lecture (hosted by Dr. Craig Henriquez), Department of Biomedical Engineering, **Duke University**, Durham (NC), USA, November 2004.
78. Department of Biomedical Engineering. **Yale University**, New Haven, (CT), November 2004.
79. IEEE Eastern NC Section, Robotics and Automation Chapter. Research Triangle Park, (NC), November 2004.
80. **Keynote speaker**. IASTED International Conference on Artificial Intelligence and Soft Computing, Marbella (Spain), September 2004.
81. Department of Electronic and Electrical Engineering, **Imperial College of Science, Technology and Medicine**, London (UK), September 2004.
82. Talent Identification Program (TIP), Dept. of Biomedical Engineering, **Duke University**, Durham (NC), USA, June 2004.
83. Spinal Cord Symposium of the Christopher Reeve Paralysis Foundation, Oak Brook Hills, IL (USA), March 2004.
84. 1st Meeting on Advances in Neuroscience. **Neurosciences Institute**, University Miguel Hernandez, San Juan de Alicante (Spain), December 2003.
85. Guest lecture (host Dr. Craig Henriquez), Department of Biomedical Engineering, **Duke University**, Durham (NC), USA, November 2003.
86. Behavioral, Ecological and Sociobiological Topics talk, Department of Biological Anthropology and Anatomy, **Duke University**, Durham (NC), November 2003.
87. Talent Identification Program (TIP), Dept. of Biomedical Engineering, **Duke University**, Durham (NC), USA, July 2003.
88. Institute of Perception, Action and Behavior weekly seminar. Division of Informatics. **University of Edinburgh**, Scotland (UK), June 2000.
89. Signal Processing Group seminar, Department of Electronics, **University of Valencia** (Spain), December 1999.

Peer-review and Committee Functions

❖ Journal

- Nature, Nature Neuroscience, Neuron, PNAS, Trends in Neurosciences, Journal of Neuroscience, Journal of Neurophysiology, Journal of Neuroscience Methods, European Journal of Neuroscience, Brain Research Bulletin, IEEE Transactions on Biomedical Engineering, IEEE Transactions on Neural Systems and Rehabilitation Engineering, IEEE Transactions on Neural Networks, Neurocomputing, Frontiers in Neuroprosthetics, Frontiers in Integrative Neuroscience. Associate Editor for IEEE Trans. on Systems, Man, and Cybernetics, parts A & B.

❖ Conferences

- IEEE Engineering in Medicine and Biology (EMBC)
 - Track chair; Session Organizer
- IEEE Neural Engineering Conference
- Neural Information Processing Systems (NIPS)
- IEEE/RAS-EMBS Int. Conf. on Biomedical Robotics & Biomechatronics,
- Simulation of Adaptive Behavior (SAB)

Languages

Spanish	Native tongue
Valencian	Native tongue
English	Fluent speaking, reading, and writing
Portuguese	Passive language skills only