

Rodolphe Héliot

Curriculum Vitae

Research Scientist
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Education

- 2007** Ph.D., Electrical engineering, Institut National Polytechnique de Grenoble, France.
2004 M.S., Electrical engineering, Université Rennes I, France.
2004 "Diplôme d'ingénieur", Ecole Supérieure d'Electricité (Supélec), France.

Professional experience

12/2009 → present	Research Scientist	CEA – LETI, Grenoble, France.
02/2008 → 07/2009	Postdoctoral researcher	Department of Electrical
	Engineering, University of California, Berkeley, USA.	
01/2005 → 01/2008	Ph.D. candidate	INRIA Rhône-Alpes, France CEA – LETI, Grenoble, France.
04/2004 → 09/2003	Intern	INRIA Rhône-Alpes, France.
04/2003 → 08/2003	Intern	UNIC – CNRS, Gif sur Yvette, France.

Languages

French: mother tongue
English: Fluent
Spanish: Conversational

Awards and grants

- 2009** Agence Nationale pour la Recherche “Retour Post-doctorants” research award
2009 ICMLC Lotfi Zadeh Best Paper Award.
2008 “Délégation Générale pour l’Armement” Postdoctoral Fellowship.
2008 Institut National Polytechnique de Grenoble Best Ph.D. thesis award.

Publications

Journals

- **R. Héliot**, K. Ganguly, J. Jimenez, and J.M. Carmena (2010) “*Learning in closed-loop brain-machine interfaces: modeling and experimental validation*” in **IEEE Transactions on Systems, Man and Cybernetics, part B**, vol 40(5), pp. 1387-1398, 2010.
- **R. Héliot**, A. Orsborn, K. Ganguly and J.M. Carmena (2010) “*System architecture for stiffness control in brain-machine interfaces*” in **IEEE Transactions on Systems, Man and Cybernetics, part A**, vol 40(4), pp. 732-742, 2010.
- C. Azevedo-Coste, **R. Héliot**, R. Pissard-Gibollet, P. Dussaud, D. Andreu, J. Froger, I. Laffont (2010) “*MASEA : Marche Assistée par Stimulation Électrique Adaptative*” in **Sciences et Technologies pour le Handicap**, vol 4(1), pp. 109-130, 2010.
- **R. Héliot**, C. Azevedo-Coste, L. Schwirtlich, and B. Espiau “*Gait spectral index (GSI): a new quantification method for assessing human gait*” in **Health**, vol 2, No.1, pp 38-44, 2010.
- **R. Héliot** and B. Espiau (2008) “*Multi Sensor Input for CPG-based Sensory Motor Coordination*”, in **IEEE Transactions on Robotics (Special Issue on Bio-Robotics)**, vol. 24(1), pp. 191-195, 2008.
- **R. Héliot** and B. Espiau (2008) “*Online Generation of Cyclic Trajectories Synchronized with Sensor Input*”, in **Robotics and Autonomous Systems**, vol. 56, pp. 410-421, 2008.
- S. Bonnet and **R. Héliot** (2007) “*A magnetometer-based approach for studying human movements*”, in **IEEE Trans. Biomedical Engineering**, vol. 54(7), pp. 1353-1355, 2007.
- C. Azevedo and **R. Héliot** (2005) “*Functional rehabilitation of posture and walk: towards a coordination of valid and deficient limbs*”, in **Journal of Automatic Control (JAC)**, vol. 15 (Supplement), pp. 11–15, 2005.

Peer-reviewed proceedings

- **R. Héliot**, A. Joubert and O. Temam (2011). “*Robust and Low-Power Accelerators based on Spiking Neurons for Signal Processing Applications*” in, **3rd HiPEAC Workshop on Design for Reliability (DFR'11)**, Heraklion, Crete, Greece, January 2011.
- **R. Héliot**, S. Venkatraman and J.M. Carmena (2010). “*Decoder remapping to counteract neuron loss in brain-machine interfaces*” in proceedings of EMBC'10,

32nd Annual **International Conference of the IEEE Engineering in Medicine and Biology Society**, Buenos Aires, Argentina, September 2010.

- **R. Héliot** and J.M. Carmena (2009). “*A model of motor learning in brain-machine interfaces: predicting neural tuning changes*” in **IEEE International Conference on Systems, Man, and Cybernetics**, San Antonio, Texas, USA, October 2009.
- J. Jimenez, **R. Héliot** and J.M. Carmena (2009). “*Learning to use a brain-machine interface: model, simulation and analysis*” in proceedings of EMBC’09, 31st Annual **International Conference of the IEEE Engineering in Medicine and Biology Society**, Minneapolis, MN, USA, September 2009.
- **R. Héliot**, K. Ganguly and J.M. Carmena (2009). “*Modeling and experimental validation of the learning process during closed-loop BMI operation*” in **International Conference on Machine Learning and Cybernetics**, Hebei, China, July 2009.

ICMLC 2009 Lotfi Zadeh Best Paper Award.

- **R. Héliot**, A. Orsborn, and J. Carmena (2008) “*An exoskeleton for impedance control in Brain-Machine Interfaces*” in **2nd IEEE RAS / EMBS International Conference on Biomedical Robotics and Biomechatronics**, Scottsdale, Arizona, October 2008.
- **R. Héliot**, B. Espiau, C. Azevedo, D. David, and D.B. Popovic (2007) “*FES-based training and gait evaluation of stroke patients using a microsensor on their valid leg*” in **International Society for Posture and Gait Research (ISPGR)**, Burlington, Vermont, July 2007.
- **R. Héliot**, S. Dosen, C. Azevedo, B. Espiau, and D.B. Popovic (2007) “*Online adaptation of optimal control of externally controlled walking of a hemiplegic individual*” in **3rd International IEEE EMBS Conference on Neural Engineering**, Kohala Coast, Hawaii, May 2007.
- **R. Héliot**, C. Azevedo, B. Espiau, and D. David (2005) “*Postural movement early detection and monitoring by observing one limb with micro-sensors*”, in **3rd International Symposium on Adaptive Motion in Animals and Machines (AMAM)**, Ilmenau, Germany, September 2005.
- **R. Héliot**, R. Pissard-Gibollet, B. Espiau, and F. Favre-Réguillon (2005) “*Continuous identification of gait phase for robotics and rehabilitation using microsensors*,” in **International Conference on Advanced Robotics (ICAR)**, Seattle, USA, July 2005.
- **R. Héliot**, C. Azevedo, and D. David (2005) “*Sensing valid limb attitude to improve deficient limb control*” in: **International Society for Posture and Gait Research (ISPGR)**, Marseille, France, May-June 2005.
- C. Azevedo and **R. Héliot** (2005) “*Réhabilitation fonctionnelle de la posture et de la marche : vers une coordination des membres valides et déficients*“, in **Journée Thématique de la Société de Biomécanique (JTSB)**. "Biomécanique du Mouvement et Handicap Moteur". Lyon, France, May 2005.

Invited conference talks

- **R. Héliot**, K. Mombaur, C. Azevedo-Coste “*Coupling CPG-based trajectory generation and Optimal Control to control online bipedal walking*” in **Humanoids workshop on Modeling, Simulation and Optimization of Bipedal Walking, 9th IEEE-RAS International Conference on Humanoid Robots**, Paris, France, December 2009.
- C. Azevedo-Coste, C. Fattal, **R. Héliot** “*Rôle du tronc dans les transferts assis-debout : Application chez le paraplégique*” in **Journée Nationale de Rééducation de Hauteville**, Hauteville, France, Avril 2009.

Book chapters

- **R. Héliot** and J. Carmena (2010) “Brain–Machine Interfaces” in: G.F. Koob, M. Le Moal and R.F. Thompson (eds.) **Encyclopedia of Behavioral Neuroscience**, volume 1, pp. 221–225 Oxford: Academic Press.
- **R. Héliot**, C. Azevedo, and B. Espiau (2007) “*Functional rehabilitation: Coordination of artificial and natural controllers*”, in **Rehabilitation Robotics**, ISBN 978-3-902613-04-2, Advanced Robotic Systems, Vienna, 2007.

Dissertations

- **R. Héliot** (2007) “*Restauration fonctionnelle de la posture et de la marche : vers la coordination des membres valides et déficients (in french)*”, Ph.D. thesis, INP Grenoble, 2007.
- **R. Héliot** (2004) “*Etude d’une orthèse instrumentée* ”, M.S. thesis, 2004.

Scientific Popularization

- “*Handicap assistance*”, **Imagine ton futur**, Septembre 2007
- “*Une jambe suit l’autre*”, **Inédit**, Mai 2007
- “*L’homme et le robot*”, **Le Dauphiné Libéré**, Édition du 8 Janvier 2007
- “*Rétablir la coordination entre membres valides et déficients*”, **Le Mensuel, CEA-Grenoble**, Octobre 2006

Patents

- V. Cattin, **R. Héliot**, and B. Guilhamat “Semelle à capteurs de force”
FR: 08 52480
- **R. Héliot**, “*Device and method for tracking the movements of a live being*”
WO/2008/058966A1, 15/11/2006
- **R. Héliot**, D. David, R. Pissard-Gibollet, and B. Espiau “*Method for estimating the phase of movement of an object*”
EP 1 721 573 / US 2006 0268986, 09/05/2005

Reviewer

Journals

IEEE Transactions on Neural Systems and Rehabilitation Engineering (TNSRE)

IEEE Transactions on Systems, Man, and Cybernetics part B (TSMC-B)

International Journal of Robotics Research (IJRR)

Journal of Neural Engineering (JNE)

Conferences

IEEE International Conference on Neural Engineering (NER)

IEEE International Conference on Biomedical Robotics and Biomechatronics (BIOROB)

International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC)

IEEE International Conference on Robotics and Automation (ICRA)

Conférence internationale sur l'accessibilité et les systèmes de suppléance aux personnes en situation de handicap (ASSISTH)