

## SOLAIMAN SHOKUR

Senior Researcher, Brain-machine interfaces, and neurorehabilitation

Ph.D., Robotics, MSc, Computer Science

40 years old, Swiss

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### EDUCATION

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- 2019 Training for persons responsible for **directing animal experiments** (LTK 2, Basel, Switzerland).
- 2007 – 2013 **Ph.D.**, Robotics, Control, and Intelligent Systems (EPFL, Lausanne, Switzerland).  
Advisors: Hannes Bleuler (EPFL) and Miguel A. L. Nicolelis (Duke University, Durham, NC). Obtained with **special distinction**.  
Dissertation title: Virtual reality-based brain-machine-interface for sensorimotor and social experiments with primates.
- 1999 – 2004 **BS, MSc**, (EPFL, Lausanne, Switzerland).  
Computer Science.
- 2004 **Exchange student**, National Research Council (CNR, Rome, Italy).  
Advisors: Prof. Dario Floreano (EPFL) and Prof. Stefano Nolfi (CNR).  
Dissertation title: toward a person-follower robot.

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### PROFESSIONAL EXPERIENCES & RESEARCH POSITION

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- Sep 2019 – **Senior Scientist**, Chaire Fondation Bertarelli translational neuroengineering, EPFL (Geneva, Switzerland).  
**Team leader** on project **CHRONOS**: multi-center European project that aims at developing the first chronically implanted prosthetic hand for transradial amputee patients with bidirectional communication capabilities, and **NCCR Robotics**: Bi-directional control of supernumerary limbs.
- 2018 – 2019 **Senior Clinical Research Coordinator**, AASDAP (São Paulo, Brazil)  
Responsible for both the scientific production and clinical protocol at the AASDAP neurorehabilitation laboratory.  
Learned expertise: Design of clinical protocols, laboratory management.
- 2014 – 2018 **Senior researcher**, AASDAP (São Paulo, Brazil).  
Head of research and development. My responsibilities included:  
- Development of a new training protocol integrating non-invasive brain-machine interfaces (BMI) with locomotion for paraplegic patients. I have

supervised the tests and the validation of the protocol with 16 paraplegic patients for 36 months.

- I supervised the protocols, data analysis and scientific production (four papers, more than 20 abstracts) for both BMI-related and clinical data.
- I supervised five master students, three engineers, and ten undergraduate students.

Learned expertise: non-invasive brain-machine interfaces for neurorehabilitation.

2013 – 2014

**Postdoctoral associate**, Walk again project, ISD (Natal, RN, Brazil).

My responsibilities included:

- Implementation of virtual-reality based brain-machine interface platform for the training of paraplegic patients.
- Head of the engineering team, in charge of the system integration. The final setup included a brain-controlled exoskeleton.
- I represented the walk again project team on the field for the kick-off of the 2014 Soccer World Cup in São Paulo, Brazil, in front of 60'000 people. The kick was done by a paraplegic patient wearing an exoskeleton.

Learned expertise: system integration, non-invasive brain-machine interfaces (EEG), real-time systems.

2010 – 2012

**Visiting scientist**, Nicoletis Lab (Duke University, Durham, NC, USA).

- Development and validation of a virtual-reality based brain-machine interface for rhesus monkeys.

Learned expertise: Neurophysiology (multi-unit recording, neural decoding), training of non-human primates, virtual reality, invasive brain-machine interfaces.

2007 – 2010

**Teaching assistant**, Laboratory of Robotics Systems (EPFL, Lausanne, Switzerland).

- Supervision of two master and one undergraduate student.
- Teaching assistant for *Static and Dynamic* course.
- I was the responsible teacher for master course *Robotics and Assembling*.

2007 – 2009

**Scientist, Laboratory of Neural Ensemble Physiology** (EPFL)

- Neurophysiology and gait analysis for quadrupedal locomotion with rats.

Learned expertise: experimentation with rodents, neurophysiology, surgery for brain implants with rodents.

2005 – 2007

Au Petit Kutchi, Le Basilic, Geneva, Switzerland. Management of my family business, two restaurants + one wine bar, ten workers, 1.5M\$ turnover.

2003 Student internship, Solar Energy and Building Physics Laboratory (EPFL)  
Validation of an algorithm for indoor temperature forecast for smart buildings.

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HONORS AND AWARDS

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Jul 2019 2019 BCI award, Nominated.  
May 2014 2013 EPFL doctorate special distinction.  
June 2013 CNPq Junior Post-Doc scholarship  
Nov 2011 Poster selected as 'Hot topic' for Society for Neuroscience 2011.

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LANGUAGES

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French, Farsi, Italian Trilingual  
English, Portuguese Fluent  
German High School knowledge

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PEER-REVIEWED JOURNAL PAPERS

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J. E. O'Doherty, **S. Shokur**\*, L. E. Medina, M. A. Lebedev, M. A. L. Nicolelis (2019). Creating a neuroprosthesis for active tactile exploration of textures. *Proceedings of the National Academy of Sciences*. <https://doi.org/10.1073/pnas.1908008116>

A. Selfslagh, **S. Shokur**\*, D. S.F. Campos, A. R. C. Donati, S. Almeida, M. Bouri, M. A. L. Nicolelis (2018). Non-invasive, Brain-controlled functional electrical stimulation for locomotion rehabilitation in paraplegic patients. *Scientific reports* 9, no. 1 (2019): 6782.

**S. Shokur**, A.R. C. Donati, D. S. F. Campos, C. M. Gitti, G. Bao, D. Fischer, S. B. Almeida, V. A. S. Braga, P. B. Augusto, C. Petty, M. Lebedev, A. W. Song, M. A. L. Nicolelis (2018). Sensorimotor, visceral, and psychological improvement in chronic paraplegic ASIA A/B patients after a training integrating brain-machine interface, visuotactile feedback and locomotion. *PloS one* 13, no. 11 (2018): e0206464.

**S. Shokur**, S. Gallo, R. C. Moioli, A. R. C. Donati, E. Morya, H. Bleuler, M. A. L. Nicolelis (2016). Assimilation of virtual legs and perception of floor texture by complete paraplegic patients receiving artificial tactile feedback, *Scientific Reports*. 6, doi:10.1038/srep32293.

A. R. C. Donati, **S. Shokur**, E. Morya, D. S. F. Campos, R. C. Moioli, C. M. Gitti, P. B. Augusto, S. Tripodi, C. G. Pires, G. A. Pereira, F. L. Brasil, S. Gallo, A. A. Lin, A. K. Takigami, M. A. Aratanha, S. Joshi, H. Bleuler, G. Cheng, A. Rudolph, M. A. L. Nicolelis (2016). Long-Term Training with a Brain-Machine Interface-Based Gait Protocol Induces Partial Neurological Recovery in Paraplegic Patients. *Scientific Reports*. 6, 30383.

P. J. Ifft, **S. Shokur**, Z. Li, M. A. Lebedev, & M. A. L. Nicolelis (2013). A brain-machine interface enables bimanual arm movements in monkeys. *Science translational medicine*, 5(210), 210ra154-210ra154.

**S. Shokur**, J. E. O'Doherty, J. A. Winans, H. Bleuler, M. A. Lebedev, & M. A. L. Nicolelis (2013). Expanding the primate body schema in the sensorimotor cortex by virtual touches of an avatar. *Proceedings of the National Academy of Sciences*, 110(37), 15121-15126.

J. E. O'Doherty, M. A. Lebedev, P. J. Ifft, K. Z. Zhuang, **S. Shokur**, H. Bleuler, & M. A. L. Nicolelis (2011). Active tactile exploration using a brain-machine-brain interface. *Nature*, 479(7372), 228-231.

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#### CONFERENCE PAPERS

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B. Mohamed, A. Selfslagh, D. Campos, S. Yonamine, A.R.C Donati, and **S. Shokur** (2019). "Closed-Loop Functional Electrical Stimulation for Gait Training for Patients with Paraplegia." In *2018 IEEE International Conference on Robotics and Biomimetics (ROBIO)*, pp. 1489-1495. IEEE.

B. Hannes, T. Vouga, A. Ortlieb, R. Baud, J. Fasola, J. Olivier, **S. Shokur**, and M. Bouri (2018). Exoskeletons as Mechatronic Design Example. *New Trends in Medical and Service Robotics*, pp. 109-117. Springer, Cham.

D. J. Zielinski, R. P. McMahan, **S. Shokur**, E. Morya, and R. Kopper (2014). Enabling Closed-Source Applications for Virtual Reality via OpenGL Intercept-based Techniques. *SEARS*, pp. 1–6.

A. Sengul, **S. Shokur**, and H. Bleuler (2013). Brain Incorporation of Artificial Limbs and Role of Haptic Feedback. *New Trends in Medical and Service Robots*. Springer International Publishing, 2014. 257-268.

M. Hara, **S. Shokur**, A. Yamamoto, T. Higuchi, R. Gassert, H. Bleuler (2010). Virtual Environment to Evaluate Multimodal Feedback Strategies for Augmented Navigation of the Visually Impaired. *32nd Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC)*, Buenos Aires, Argentina

L. Righetti, **S. Shokur**, and M. S. Capcarrere (2003). Evolution of fault-tolerant self-replicating structures. *In European Conference on Artificial Life VIII (ECAL'03)*, pages 278–288, Berlin.

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#### ABSTRACTS

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E. Alho, **S. Shokur**, S. Yamauti, D. Campos, Y. Shan, G. Shan, J. Lu, W. Song, Y. Tang, G. Zhao, M. A. Nicolelis (2019). Surface-based morphometric brain analysis in paraplegic patients after training with brain-machine interfaces, visuo-tactile feedback and assisted locomotion. *In 49th Society for Neuroscience Meeting, Chicago, IL*.

**S. Shokur**, D. Schwarz, D. S. F. Campos, A. C. Donati, G. Bao, N. M. P. C. Rios, A. Lin, A. Takigami, M. A. Aratanha, S. Y. Yamauti, S. S. Joshi, R. C. Muioli, F. L. Brasil, E. Morya, M. A. Nicolelis (2019). Validation of an assistive-oriented and rehabilitative-oriented brain-machine interface paradigm for locomotion restoration in a group of patients with chronic complete spinal cord injury. *In 49th Society for Neuroscience Meeting, Chicago, IL*.

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ABSTRACTS (continue)

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**S. Shokur**, F. Asnis, S. Almeida, M.A.L. Nicoletis (2018). The peripersonal space representation in paraplegic patients depends on the level of lower-limb residual neurological functions. *In 48th Society for Neuroscience Meeting*, San Diego, CA.

T. Vouga, A. Ortlieb, R. Baud, J. Fasola, J. Olivier, **S. Shokur**, M. Bouri (2018). Personalized Exoskeleton Development: Three Examples. *BCNAE: Body Consciousness in Natural and Artificial Environments*. Reutlingen, Germany.

**S. Shokur**, A. R. C. Donati, M. A. L. Nicoletis (2017). Long-term training with non-invasive brain machine-interfaces and locomotion promotes neurological improvement in patients with chronic complete paraplegia: a pilot clinical trial. *In 47th Society for Neuroscience Meeting*. Washington, DC.

A. Selfslagh, **S. Shokur**, A. R. C. Donati, D. S. F. Campos, S. B. de Almeida, N. Padula, H. Bleuler, M. Bouri, M. A. L. Nicoletis (2017). Locomotion training with closed-loop brain-machine interface and lower-limb functional electrical stimulation for complete paraplegic patients. *In 47th Society for Neuroscience Meeting*. Washington, DC.

A. R. C. Donati, **S. Shokur**, D. S. F. Campos, M. A. L. Nicoletis (2017). Development of a New Motor Assessment for Spinal Cord Injury Patients. *In International Neurorehabilitation Symposium (INRS)*, London.

D. S. F. Campos, A. Selfslagh, **S. Shokur**, A. R. C. Donati, D. Fischer, M. Bouri, H. Bleuler, M. A. L. Nicoletis (2017). Developing a new synergic muscle contraction gait model produced by surface functional electrical stimulation (FES) in humans after complete spinal cord injury (SCI). *In Annual Meeting of the International Functional Electrical Stimulation Society (IFESS)*, London.

M. A. L. Nicoletis, A. R. C. Donati, **S. Shokur**, E. Morya (2016). Brain-machine-interface based neurorehabilitation induces partial neurological recovery in paraplegic patients. *In 9TH World Congress for neurorehabilitation*, Philadelphia, PA.

A. R. C. Donati, **S. Shokur**, D. S. F. Campos, C. G. Pires, D. Fischer, E. Morya, M. A. L. Nicoletis (2016). Improvement of trunk stability in chronic paraplegic patients after long-term training with robotic orthotic trainers. *In 9TH World Congress for neurorehabilitation*, Philadelphia, PA.

**S. Shokur**, A. R. C. Donati, R. C. Moioli, M. A. L. Nicoletis (2016). Tactile feedback restoration using sensory substitution in chronic paraplegic patients. *In 9TH World Congress for neurorehabilitation*, Philadelphia, PA.

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ABSTRACTS (continue)

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**S. Shokur**, A. R. C. Donati, D. S. F. Campos, D. Fischer, P. B. Augusto, C. M. Gitti, G. Bao, E. Morya, M. A. L. Nicolelis (2016). Partial sensorimotor recovery in chronic complete spinal cord injury patients following a 24-month neuro-rehabilitation training with brain-machine interface controlled virtual and robotic gait devices. *In 46th Society for Neuroscience Meeting*, San Diego, CA.

A. Essig, **S. Shokur**, A. Schaller, S. Gallo, A. R. C. Donati, G. Bao, M. Bouri, H. Bleuler, M. A. L. Nicolelis (2016). Measuring lower limb peripersonal space in spinal cord injury patients using an audio-tactile stimulation. *In 46th Society for Neuroscience Meeting*, San Diego, CA.

D. S. F. Campos, A. R. C. Donati, D. Fischer, **S. Shokur**, M. A. L. Nicolelis (2016). Active Rehabilitation program for motor complete spinal cord injury: impact on motor neurological recovery. *In XXV Congresso Brasileiro de Medicina Física e Reabilitação*, São José do Rio Preto, SP, Brazil.

P. B. Augusto, C. M. Gitti, A. R. C. Donati, **S. Shokur**, M. A. L. Nicolelis (2016). Changes in body image after training with virtual reality for patients with chronic spinal cord injury. *In XXV Congresso Brasileiro de Medicina Física e Reabilitação*, São José do Rio Preto, SP, Brazil.

V. A. Sousa Braga, A. R. C. Donati, **S. Shokur**, M. A. L. Nicolelis (2016). Improvement of bowel functions in patients with chronic spinal cord injury following a long-term neurorehabilitation training. *In XXV Congresso Brasileiro de Medicina Física e Reabilitação*, São José do Rio Preto, SP, Brazil.

**S. Shokur**, S. Gallo, R. Muioli, M. Bouri, E. Morya, H. Bleuler, M. A. L. Nicolelis (2015). Inducing paraplegic patients to perceive distinct ground textures using tactile feedback generated by virtual feet. *In Society for Neuroscience 45nd Annual Meeting*, Chicago, IL.

F. L. Brasil, **S. Shokur**, R. C. Muioli, A. R. C. Donati, E. Morya, M. A. L. Nicolelis (2015). Walk using single leg control at BMI driven exoskeleton. *In Society for Neuroscience 45nd Annual Meeting*, Chicago, IL.

M. A. Aratanha, S. Shokur, F. Brasil, A. R. C. Donati, S. Gallo, E. Morya, M. A. L. Nicolelis (2015). Closed loop brain controlled avatar training for locomotion with spinal cord injured patients. *In Society for Neuroscience 45nd Annual Meeting*, Chicago, IL.

A. R. C. Donati, **S. Shokur**, E. Morya, C. Gitti, P. Augusto, G. Dias, D. Campos, D. Yoshihara, M.A.L Nicolelis (2015). Twelve months of physical rehabilitation protocol integrating brain controlled locomotor training and tactile feedback for patients with chronic spinal cord Injury. *In Society for Neuroscience 45nd Annual Meeting*, Chicago, IL.

R. Muioli, **S. Shokur**, S. Gallo, F. Brasil, E. Morya, M. Nicolelis (2015). Cortical incorporation of virtual legs in Spinal Cord Injured patients. *In Society for Neuroscience 45nd Annual Meeting*, Chicago, IL.

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ABSTRACTS (continue)

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M. A.L. Nicoletis, **S. Shokur**, A. Lin, R. Muioli, F. Brasil, N. Peretti, K. Fast, A. Takigami, E.Morya, G. Cheng, L. Sawaki, R. Kopper, D. Schwarz, S. Gallo, M. Lebedev, S. Joshi, H. Bleuler, A. Rudolph. The Walk Again Project: Using a Brain-Machine Interface for establishing a bi-directional Interaction between paraplegic subjects and a lower limb exoskeleton (2014). *In Society for Neuroscience 44nd Annual Meeting*, Washington, DC.

F. L. Brasil, R. C. Muioli, **S. Shokur**, K. Fast, A. L. Lin, N. A. Peretti, A. Takigami, K. Lyons, D. J. Zielinski, L. Sawaki, S. Joshi, E. Morya, M. A. L. Nicoletis. The Walk Again Project: an EEG/EMG training paradigm to control locomotion (2014). *In Society for Neuroscience 44nd Annual Meeting*, Washington, DC.

A. Lin, D. Schwarz, R. Sellaouti, **S. Shokur**, R. C. Muioli, F. L. Brasil, K. R. Fast, N. A. Peretti, A. Takigami, S. Gallo, K. Lyons, P. Mittendorfer, M. Lebedev, S. Joshi, G. Cheng, E. Morya, A. Rudolph, M. Nicoletis (2014). The walk again project: brain-controlled exoskeleton locomotion. *In Society for Neuroscience 44nd Annual Meeting*, Washington, DC.

R. C. Muioli, F. L. Brasil, **S. Shokur**, A. L. Lin, K. Fast, N. Peretti, A. Takigami, D. Schwarz, E. Morya, M. A. L. Nicoletis (2014). The Walk Again Project: Analysis of brain activity of spinal cord injury patients during training with a BMI. *In Society for Neuroscience 44nd Annual Meeting*, Washington, DC.

A. Ramakrishnan, P. J. Ifft, Z. Li, **S. Shokur**, M. A. Lebedev, M. A. L. Nicoletis (2014). Brain-machine interface featuring cooperation and social interaction. *In Society for Neuroscience 43nd Annual Meeting*, San Diego, CA.

P. Ifft, **S. Shokur**, M. Lebedev, Z. Li and M. A. L. Nicoletis (2012). Bimanual brain-machine interface. *In Society for Neuroscience 42nd Annual Meeting*, New Orleans, LA.

**S. Shokur**, J.A. Winans, J.E. O’Doherty, M. A. Lebedev, H. Bleuler and M. A. L. Nicoletis. (2012). Beyond the homunculus: Visual responses of primary somatosensory cortex (S1) neurons to virtual touch of a virtual arm. *In Society for Neuroscience 42nd Annual Meeting*, New Orleans, LA.

**S. Shokur**, P. Ifft, M. A. Lebedev, H. Bleuler and M. A. L. Nicoletis (2011). Social interaction probed by reaching to face images: Rhesus monkeys consider a textured monkey avatar as a conspecific. *Society for Neuroscience 41nd Annual Meeting*, Washington, DC.

A. Tate, **S. Shokur**, H. Bleuler, and M. A. L. Nicoletis (2008). Predicting locomotor activity via neural ensemble recordings in the primary motor cortex in rats. *Society for Neuroscience 38th Annual Meeting*, San Diego, CA.

**S. Shokur**, A. J. Tate, H. Bleuler, and M. A. L. Nicolelis (2008). Gait pattern prediction via bilateral neural ensemble recordings in motor cortex in rats. *In* 6th FENS Forum of European Neuroscience (FENS), Geneva, Switzerland.

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TALKS AND SCHOLARLY PRESENTATIONS

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- Mar 2019                      Invited speaker. (Host: Dr. Hugo Peluffo). *Neurotrauma 2019 Institut Pasteur de Montevideo*, Uruguay.
- Feb 2019                      Symposium speaker. (Host: Prof. Hannes Bleuler). *Laboratory of Robotics Systems*. Weisshorn, Switzerland.
- Dec 2018                      Invited speaker. (Host: Prof. Marcelo Becker). *IEEE Robotics and Automation Society – RAS. PIE2, University of Sao Paulo*, Brazil.
- Dec 2018                      Symposium speaker. (Host: Prof. Rómulo Fuentes). *Instituto de Neurociências BNI, University of Chile*, Santiago, Chile.
- Sep 2018                      Invited speaker (Host: Prof Riener). Sensorimotor improvements in chronic complete paraplegic patients after a training integrating brain-machine interfaces, visuotactile feedback and locomotion. *Sensory-motor systems lab, ETH*, Zurich, Switzerland.
- Aug 2018                      Keynote speaker (Host: Asociación Nacional de Estudiantes de Bioquímica). *XXXV National Congress of Biochemistry*, Santiago, Chile.
- Sep 2017                      Invited speaker (Host: Dr. Marcelo Ricardo de A. Sartori). Brain-Machine Interfaces based neuro-rehabilitation and sensory substitution. *Hospital AACD*, São Paulo, Brazil
- May 2017                      Invited speaker (Host: Prof. Adriano Siqueira). Brain-Machine Interfaces based neuro-rehabilitation and sensory substitution with spinal cord injury patients. *Universidade de São Paulo, USP - São Carlos*, São Carlos, Brazil
- May 2017                      Invited Speaker. Walk Again Project. From São Paulo to the world: neuroscience, robotics and virtual reality revolutionizing treatment for paraplegia. *Swissnex*, São Paulo, Brazil.
- Mar 2017                      Invited speaker (Host: Prof. Jean Fabre). Brain-machine interfaces-based neuro-rehabilitation and sensory substitution. *Department of Neurology and neurosurgery, Universidade Federal de São Paulo*, São Paulo, Brazil.
- Nov 2016                      Symposium speaker: Sensory substitution and changing in body schema representation. *Institute of Psychiatry FMUSP*, São Paulo, Brazil



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TALKS AND SCHOLARLY PRESENTATIONS (continue)

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- Jan 2016                      Invited speaker (Host: Prof. Hannes Bleuler). Walk assistance for paraplegics with haptic feedback. *LNCO – LSRO – RELAB workshop*, Leysin, Switzerland
- August 2014                      Invited speaker (Host: Prof Benabid). Brain-machine interfaces: Closing the Loop, *Clincatec*, Grenoble, France
- June 2014                      Invited speaker (Host: Dr. Mohamed Bourri). A Brain Controlled Exoskeleton for the opening of the 2014 Soccer World Cup. *New Trends in Medical and Service Robots, MeSRoB*, EPFL, Lausanne, Switzerland
- Sep 2013                      Symposium speaker. A brain-controlled avatar. *Walk-again project symposium, Hospital AACD*, São Paulo, Brazil
- June 2013                      Invited speaker (Host: Prof. Olaf Blanke). Virtual reality-based brain-machine interface. *Laboratory of Cognitive Neuroscience, EPFL*, Lausanne, Switzerland
- July 2013                      Symposium Speaker. Brain Incorporation of artificial limbs and the role of haptic feedback. *New Trends in Medical and Service Robots, MeSRoB*, Belgrade, Serbia
- May 2013                      Invited speaker (Host: Dr. Holger Franz Sperdin). Brain-machine interfaces and virtual reality with primates. *Hospital Universitaire de Genève*, Geneva, Switzerland
- May 2013                      Invited speaker (Host Prof: Roger Gassert). Brain-machine interfaces and incorporation of virtual limbs. *Rehabilitation engineering lab, ETH*, Zurich, Switzerland
- February 2013                      Retreat speaker. Virtual reality-based brain-machine-interface for sensorimotor and social experiments with monkeys, Leysin, Switzerland
- September 2010                      Symposium speaker. Virtual Environment to Evaluate Multimodal Feedback Strategies for Augmented Navigation of the Visually Impaired. *Annual International Conference of the IEEE EMBC*, Buenos Aires, Argentina
- June 2009                      Speaker. Brain-computer interfaces. *5th International surgery course Hospital Universitaire de Genève*, Geneva, Switzerland
- November 2008                      Speaker. Neuroprosthetics at EPFL. *4th Geneva International Robotic and surgery course, Hospital Universitaire de Genève*, Geneva, Switzerland
- May 2007                      Invited speaker (Host Valerio Pellizzari), Festival Vicino Lontano, Udine, Italy

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PROFESSIONAL SOCIETIES

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2019 - International Experts Project (Ministry of Science and Technology, China)  
2018 - Cytel/Neurosul (South America)  
2018 - International society for virtual rehabilitation  
2018 - BCI society  
2018 - World Federation for Neurorehabilitation  
2016 - Clinical BMI society  
2011 - Society for Neuroscience

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JOURNAL REVIEWING

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Scientific Report	Brain Imaging and Behavior
PLoS one	Frontiers Robotics and AI
Journal of Neuroscience	Frontiers in Neural Technology
Frontiers in Neurosciences	
Spinal Cord	