

November 14, 2023

2023 was busy for WFNR Robotics Special Interest Group (SIG). Highlights from recent events in Australia and the USA in 2023 are listed below. In addition, we are assisting with the organization of four events in 2024 that will be held in Canada, France, Germany, and the USA. We invite you to attend each of these events.



6th Annual Meeting of the Rehabilitation Medicine Society of Australia and New Zealand
10-13 September, 2023: Hobart, TAS, Australia.

Plenary 7 - Technology in Rehabilitation: Innovating rehabilitation robotics through research

Robotics may be helpful for regaining independent movement in conditions affecting the human motor system. But what defines a robot in the context of rehabilitation, and are they effective? This lecture described research that aims to investigate defined treatment regimens in patients who might reasonably be expected to benefit based on clinical presentation. Issues were discussed relating to practicalities of use, staff training and safety, and access to such technologies that have typically been limited to large metropolitan hospitals.

Speaker: Ray Russo, MD – Women's and Children's Hospital in Adelaide South Australia
Leveraging rehabilitation robotics to enhance clinical care

Speaker: Taya Hamilton, BPT – Perron Institute for Neurological and Translational Science
Clinical Integration and Adoption of Rehabilitation Robotics

Speaker: Dylan Edwards, PhD – Moss Rehabilitation Research Institute, Thomas Jefferson University
Innovating rehabilitation robotics through research

[American Academy of Physical Medicine and Rehabilitation Annual Meeting](#)
15-19 November, 2023: New Orleans, LA, USA.

Point/Counterpoint Session: Debating controversial neurorehabilitation topics: Robotics in Neurorehabilitation for Stroke

During this entertaining educational session a discussion took place, comparing the use of "donated funds" for implementation of robotic therapy versus training for therapists. Arguments were made in favor, and against the use of technology for Rehabilitation, and in the end the consensus with the robotics will continue to permeate rehabilitation care with improved efficiencies and outcomes but that training on how to best utilize these are devices is also a key element.

Chair, Thomas Watanabe, MD – MossRehab

Faculty: Ross D. Zafonte, DO – Spaulding Rehabilitation Hospital/Harvard Medical School

Faculty: Gerard E. Francisco, MD – University of Texas Health Science Center At Houston

Faculty: Alberto Esquenazi, MD – Jefferson Moss-Magee Rehabilitation, Thomas Jefferson University Hospitals



Notes from SIG-Robotics

November 2023



Hermano Igo Krebs, Ph.D.
MIT, The 77 Lab, Cambridge, MA, USA



Dylan J. Edwards, Ph.D.
Moss Rehabilitation Research Institute, Philadelphia, PA, USA

We invite you to participate in the [Moss-Magee Program in Advanced Application of Technology for the Lower Extremity](#) beginning 16, April 2024. This will include online webinars and an in-person event in Philadelphia, USA.

We invite you to participate in the [13th World Congress for NeuroRehabilitation](#). This conference will take place on 22-25 May, 2024 in Vancouver, Canada.

**Please join us on 24 May, 2024 in our Symposium:
"From the bedside to home, robotics and technology for rehabilitation"**

We also invite you to join us for the [2^{ème} NEUROSOL SYMPOSIUM: LES AVANCÉES EN NEURORÉÉDUCATION](#). This meeting will take place on 15 June, 2024 in Clinique les Trois Soleils, Boissise-le-Roi, France.

In addition, please consider joining us for the [IEEE-BioRob 2024: 10th International Conference on Biomedical Robotics and Biomechatronics](#). This conference will take place on 1-4 September, 2024 in Heidelberg, Germany.

Mark your calendars for the 2024 Biennial International Symposium Robotics and Technology in Rehabilitation: Bridging Science and Clinical Care on 13-14 September, 2024 in Philadelphia, USA. Please email sheila.Wallace@jefferson.edu to express interest.

If you're interested in joining the Robotics Special Interest Group (SIG), please contact mary.czerniak@jefferson.edu.

Upcoming Events in 2024 :

[Moss-Magee Program in Advanced Application of Technology for the Lower Extremity](#)

Webinars begin 16, April 2024

In-person event 31 May -1 June, 2024 : Philadelphia, USA

This program will feature six weeks of live webinars on Tuesday evenings from 7 - 9 pm ET, with the first webinar held on 16 April, 2024. There will also be a one and a half day in-person experiential activity on 31 May and 1 June, 2024 following the conclusion of the six week online program.



Vancouver
22-25 May 2024
CANADA



[WFNR 13th World Congress for Neurorehabilitation](#)

22-25 May, 2024: Vancouver, Canada

Symposium: From the bedside to home, robotics and technology for rehabilitation

Foundations of contemporary neurorehabilitation include recovering function and harnessing brain plasticity through practice. Emergent technology can be used as a therapeutic tool by rehabilitation clinicians, and an increasing range of products enable engaging and quantifiable therapy. When the nature of the prescribed therapy using technologies matches the clinical therapeutic goals, and can be used with clinical progression and oversight, such tools offer a new horizon for access to therapy that has historically been under-dosed and uninspiring. With the rapid acceptance of telecommunication in recent years (including in older adults), together with new evidence from clinical trials that supports the benefits and cost-effectiveness of remotely supervised therapy, an opportunity exists to promote a smooth transition to community care, and increase the amount of therapy received. The transition of robotics from bedside to the home represents a major innovation in the field. At present, there are no scientifically accepted home-based robotics mobile health systems available at low-cost. Importantly, existing gaming systems for home use do not adequately meet the needs of more impaired neurological patients. Robotic systems can fill this void, potentially having large impacts on many people. Our four speakers bring unique perspectives from their experiences in hospital, engineering, industry, and rehabilitation science, to discuss the current state of the art, progress, challenges, and opportunities.

Speaker: Dylan Edwards, PhD – Moss Rehabilitation Research Institute, Thomas Jefferson University
A framework for bedside to home robotic; science and practicalities

Speaker: Alberto Esquenazi, MD – Jefferson Moss-Magee Rehabilitation, Thomas Jefferson University Hospitals
The MossRehab experience in pioneering rehabilitation robotics and technology, the way forward

Speaker: Taya Hamilton, BPT – Perron Institute for Neurological and Translational Science
The intersection of industry, practice, and science: global implementation experiences

Speaker: Hermano Igo Krebs, PhD - Massachusetts Institute of Technology
Rehab Robots in the home, breakthrough technology updates

2024 Meeting of the Robotics SIG

*The WFNR Robotics SIG will gauge member interest in a potential onsite meeting during the Congress. The goal of this meeting will be to assess our achievements and progress since the 12th World Congress for Neurorehabilitation and discuss future steps. More information to come. Please register interest by contacting mary.czerniak@jefferson.edu. [2^{ème} NEUROSOL SYMPOSIUM: LES AVANCÉES EN NEURORÉÉDUCATION](#),

15 June, 2024 Clinique les Trois Soleils, Boissise-le-Roi, France
(Evènement gratuit Inscrivez-vous dès maintenant sur EVENIUM /
Free event - register now on EVENIUM: <https://evenium.events/jdr0cmiz/>)

Following the success of the previous symposium at the Clinique Les Trois Soleils in October 2022, we will assist in the 2nd symposium in mid-June 2024, which aims to highlight the evolution of knowledge about post-stroke neuroplasticity as well as changes in rehabilitation practices.

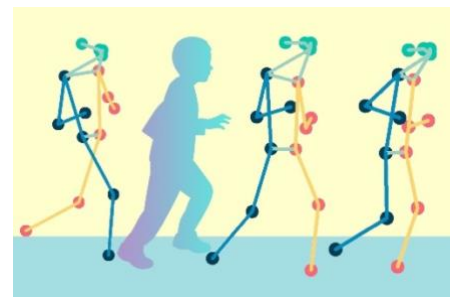
The Clinique Les Trois Soleils, a French establishment specializing in nervous system disorders, has been a reference facility in the Parisian area for post-stroke treatment for the past two decades and a pioneer in the evolution of rehabilitation practices with the progressive integration of new technological tools used routinely by rehabilitation professionals (mainly physiotherapists and occupational therapists) since the mid-2000s.

This symposium will provide a wonderful opportunity for exchange with international-level presentations and a large audience of participants involved in the fields of neurology and neurorehabilitation. In total, there will be ten presentations, covering a wide range of topics from post-stroke neuroplasticity to the integration of new technologies and surgery in the field of specialized rehabilitation.

NEWS:

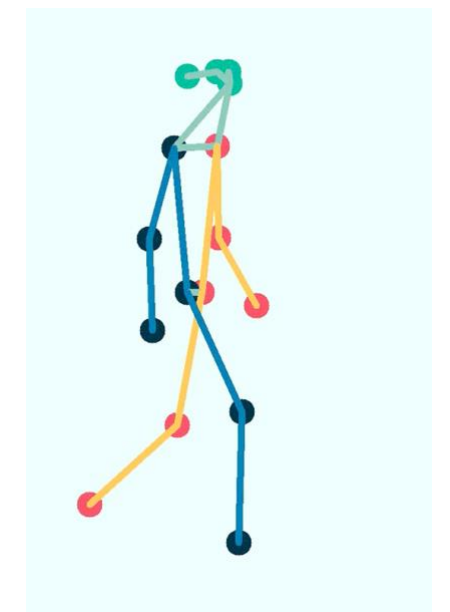
We would like to highlight that our efforts go beyond robotics and include neuromodulation and artificial intelligence. See for example [A pose-mapping technique could remotely evaluate patients with cerebral palsy | MIT News | Massachusetts Institute of Technology](#).

*A posemapping technique could remotely evaluate patients with cerebral palsy.
The machine-learning method works on most mobile devices and could be expanded to assess other motor disorders outside of the doctor's office.*

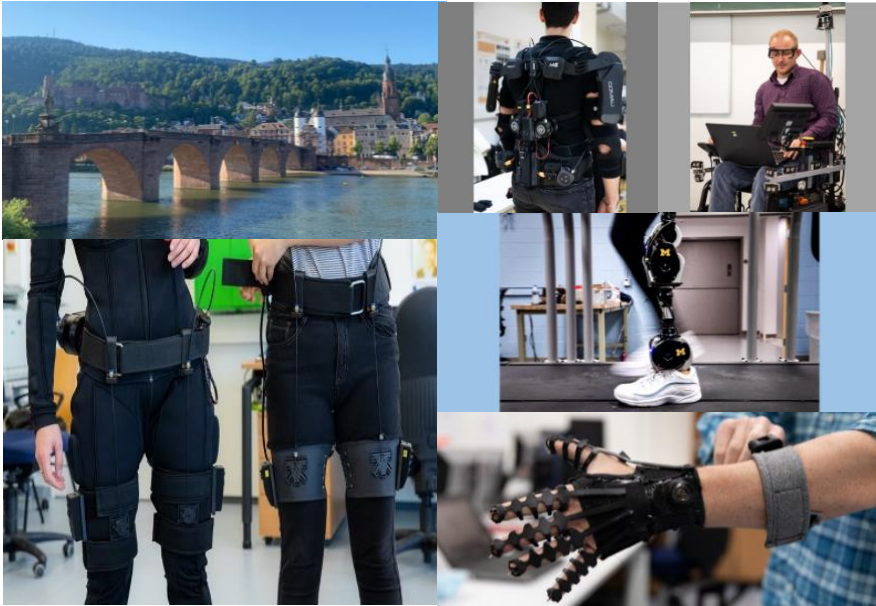


"We asked ourselves, how could we expand the good results we got with rehab robots to a ubiquitous device?" Krebs recalls. "As smartphones are everywhere, our goal was to take advantage of their capabilities to remotely assess people with motor disabilities, so that they could be evaluated anywhere."

"This approach could be easily expandable to other disabilities, such as stroke or Parkinson's disease, once it is tested in that population using appropriate metrics for adults," says Alberto Esquenazi, Chief Clinical Officer and John Otto Haas Endowed Chair of Physical Medicine and Rehabilitation at Jefferson Moss-Magee Rehabilitation and Enterprise SVP for Rehabilitation and Post-Acute care at Thomas Jefferson University Hospitals, who was not involved in the study. "It could improve care and reduce the overall cost of health care and the need for families to lose productive work time, and it is my hope [that it could] increase compliance."



[IEEE-BioRob 2024: 10th International Conference on Biomedical Robotics and Biomechatronics](#),
1-4 September, 2024 Heidelberg, Germany



BioRob delves into both theoretical and practical challenges arising from the integration of robotics and mechatronics into medicine and biology. The main objective of Biorobotics is to evaluate biological systems through a 'biomechatronic' lens, striving to unravel the scientific and engineering principles that underpin their exceptional performance. This deep comprehension of biological system functions, behaviors, and interactions serves two primary purposes: to inform the design and creation of new, high-performance bio-inspired machinery and systems for various applications, and to foster the development of innovative nano-, micro-, and macro-devices that can act upon, replace, or assist human beings in areas such as disease prevention, diagnostics, surgical procedures, prosthetics, rehabilitation, and personal assistance.

**2024 Biennial International Symposium
Robotics and Technology in Rehabilitation: Bridging Science and Clinical Care**

Hosted by Jefferson Moss-Magee Rehabilitation Hospital & Moss Rehabilitation Research Institute
13-14 September, 2024, Philadelphia, USA.

To reserve your place, please send an expression of interest to sheila.Wallace@jefferson.edu.

PAPERS:

We recommend reading the following recent papers:

Talaty, M. and Esquenazi, A. Feasibility and outcomes of supplemental gait training by robotic and conventional means in acute stroke rehabilitation. *Journal of NeuroEngineering and Rehabilitation* (2023).

Zhao, P., Alencastre-Miranda, M., Shen, Z., O'Neill, C., Whiteman, D., Gervas-Arruga, J., Krebs, H.I., Motor Function Assessment of Children with Cerebral Palsy using Monocular Video, *Proceedings of IEEE-EMBS International Conference on Body Sensor Networks: Sensor and Systems for Digital Health (IEEE BSN 2023)*.

For more information on WFNR SIG on Robotics, visit:

<https://mrii.org/world-federation-for-neurorehabilitation/>

Chair: Dylan J. Edwards, PhD.
(dylan.edwards@jefferson.edu)

Co-Chair: Hermano Igo Krebs, PhD.
(hikrebs@mit.edu)

Clinical Advisor: Alberto Esquenazi, MD.