

# Robotics and Technology in Rehabilitation Symposium

Friday, October 8 and Saturday, October 9, 2021



Location: Mayer Family Conference Center  
MossRehab, 60 Township Line Road  
Elkins Park, PA 19027  
With Virtual Option

Hosted by:



# Robotics and Technology in Rehabilitation Symposium

## Presentation Overview

This course represents the state of the science and clinical practice in rehabilitation robotics applied in neurorecovery. It spans robot design history to present day soft-robotics, as well as clinical integration and practicalities, and robotic devices as assessment tools. Finally, hands-on practical sessions with the latest devices used clinically will be included. Limitations and future directions in the field of rehabilitation robotics will be discussed. The symposium includes world leading clinicians and scientists in neurorehabilitation as well as engineering and human motor control experts.

**Program Objectives:** At the conclusion of this activity, participants should be able to:

1. describe the rationale for using robotic devices in neurorehabilitation
2. describe basic design features and operation of rehabilitation robotic devices
3. list several current devices used in neurorehabilitation
4. differentiate between an exoskeleton device and an end-effector device
5. list (2) examples of how robotic devices can be used to assess human function
6. list (2) examples of present limitations of robotic devices in neurorehabilitation applications



**Contact Hours:** 12.5

**Course Level:** Intermediate

## Target Audience

Rehabilitation Scientists, Allied Health Professionals, Occupational Therapists, Occupational Therapy Assistants, Physical Therapists, Physical Therapy Assistants, Rehabilitation Engineers, Physicians, Clinical Administrators.



**Fee:** \$400 in person  
\$350 online

**Student:** \$100 (Please include Name of School and Student ID# when registering)

**Venue:**

Moss Rehab  
Mayer Conference Center  
60 Township Line Road  
Elkins Park, PA 19027  
With Virtual Option via Zoom

**Refreshments:**

Complimentary Continental Breakfast and Lunch will be provided. Hors d'oeuvres and cocktails will be served at the Social Mixer on Friday.

**Accommodations, Directions and Parking:** For a listing of recommended hotels in the area, directions, and parking information visit: [www.mossrehab.com/continuingeducation](http://www.mossrehab.com/continuingeducation)

Transportation from Center City Philadelphia, PA will be available. To request transportation indicate on the registration form or contact Sheila Wallace via email at [wallacsh@einstein.edu](mailto:wallacsh@einstein.edu) or by phone 215-663-6457.



**COVID-19 Information:** As a healthcare facility, MossRehab follows all CDC guidelines for COVID-19. Due to the current trends in new COVID-19 cases, and in the interest of protecting the health and safety of all those who will be attending the Conference, we are asking that all attendees be fully vaccinated, and show proof of vaccination upon arrival on-site.

## DAY 1: Friday, October 8, 2021

- 8:00 am** Registration and Continental Breakfast
- 8:30 am** Introductory Remarks  
*Dylan Edwards, PhD and Alberto Esquenazi, MD, Conference Co-Chairs*
- 8:45 am** Rehabilitation Robotics, From Development to Marketing  
*Hermano Igo Krebs, PhD*
- 9:20 am** Propulsion-augmenting soft robotic exosuits for gait assistance and rehabilitation after stroke  
*Louis Awad, PT, DPT, PhD*
- 9:55 am** Break
- 10:10 am** Translation of Technology into Clinical Practice: Examples from an MS Program  
*Deborah A. Backus, PhD, FACRM*
- 10:45 am** Integrating Technology in Neurorehabilitation Clinical Trials  
*Gerard Francisco, MD*
- 11:20 am** Clinical Application of Lower Extremity Devices  
*Ning Cao, MD and Andrew Packel, PT, NCS*
- 12:05 pm** Clinical Application of Upper Extremity Devices  
*Jaun May, OTR/L and Casey McKee, OTR/L*
- 12:50 pm** Lunch (please visit Exhibitor tables in person or virtually)
- 1:40 pm** Robots for Fall Prevention in the Orthopaedic Patient  
*Jess Lonner, MD*
- 2:15 pm** Break
- Clinical Demonstrations led by MossRehab Clinicians:** *Samantha Adams, OTR/L, BCPR, Erika Harold, PT, DPT, NCS, Elizabeth Marcy, PT, DPT, NCS, Casey McKee, OTR/L, Samantha Snapp, MS, OTR/L, Nicole Sosa, PT, DPT, Stephanie Stein, MS, OTR/L, Matthew Vnenchak, PT, MS, NCS, Joseph Woltemate, MOT, OTR/L.*
- Demonstrations led by MossRehab Clinicians:** *Hocoma Armeo Spring, C-Mill, Andago, Heaxel Icone, Tyromotion Amadeo, Diego, Myro, THERA-Trainer Lyra, Ekso Bionics EksoNR*
- 2:45 pm** Clinical Demonstration /Lab—Small groups A, B, C, D
- 3:30 pm** Clinical Demonstration /Lab—Small groups A, B, C, D
- 4:15 pm** Panel Discussion—*Clinical Application of Robotics in Neurorehabilitation*  
Facilitated by Shailesh Kantak, PT, PhD

### **Social Mixer—Friday** (immediately following Panel Discussion):

Join your fellow colleagues and exhibitors for a social gathering to network and relax in the beautiful Alice and Herbert Sachs Therapeutic Conservatory.

## DAY 2: Saturday, October 9, 2021

- 8:00 am Continental Breakfast
- 8:30 am **Gait Training in Motor Incomplete Spinal Cord Injury Using Exoskeleton Robotics**  
*Dylan Edwards, PhD*
- 9:00 am **From Assessing Impairment to Tailored Intervention: How Technology Can Benefit Rehabilitation Research.**  
*Amanda Therrien, PhD*
- 9:30 am **Assessing Subtle Sensorimotor Impairments Post-Stroke: A Robotics-Based Approach**  
*Aaron Wong, PhD*
- 10:00 am Break
- 10:15 am **Tele-Rehabilitation for Stroke**  
*Steven C. Cramer, MD, MMSc, FAAN, FAHA*
- 10:50 am **Virtual Reality for Sensorimotor Assessment and Mobility Training**  
*James Finley, PhD*
- 11:25 am **Virtual Reality Technology for Assessment and Treatment in Rehabilitation**  
*Laurel Buxbaum, PsyD*
- 11:55 am Lunch (*please visit Exhibitor tables*)
- 12:55 pm **Robot-aided Recovery after Stroke: Role of Sensation, Synergies and Success**  
*David Reinkensmeyer, PhD*
- 1:30 pm Break
- Clinical Demonstrations led by MossRehab Clinicians:** *Samantha Adams, OTR/L, BCPR, Erika Harold, PT, DPT, NCS, Elizabeth Marcy, PT, DPT, NCS, Alexey Nastaskin, MS, OTR/L, Samantha Snapp, MS, OTR/L, Nicole Sosa, PT, DPT, Stephanie Stein, MS, OTR/L, Matthew Vnenchak, PT, MS, NCS, Joseph Woltemate, MOT, OTR/L.*
- Demonstrations led by MossRehab Clinicians:** *Hocoma Armeo Spring, C-Mill, Andago, Heaxel Icone, Tyromotion Amadeo, Diego, Myro, THERA-Trainer Lyra, Ekso Bionics EksoNR*
- 2:00 pm **Clinical Demonstration /Lab—Small groups A, B, C, D**
- 2:45 pm **Clinical Demonstration /Lab—Small groups A, B, C, D**
- 3.30 pm **Panel Discussion—Robotics for Research, Assessment and Clinical Care**  
Facilitated by Alberto Esquenazi, MD
- 4:15 pm Concluding Remarks

## Meet the Faculty



**Dylan Edwards, PhD**, Director, Moss Rehabilitation Research Institute, Director, Laboratory for Stroke Motor Recovery  
*Dr. Edwards' research focuses on recovery of motor function following stroke and spinal cord injury. His work uses rehabilitation robotics to standardize high-dose physical therapy of the arm and gait function. Non-invasive brain stimulation is used as an experimental treatment tool in combination with robotic therapy, as well as an outcome predictor.*



**Alberto Esquenazi, MD**, John Otto Haas Chair of the Department of Physical Medicine and Rehabilitation, Director, Gait and Motion Analysis Laboratory and Clinical Director of the Regional Amputee Center, MossRehab  
*Dr. Esquenazi is also Professor of PM&R at Temple University and the Jefferson School of Medicine and Adjunct Professor of Bioengineering at Drexel University. His research focuses on gait analysis, prosthetics, orthotics, spasticity management and robotics and technology in rehabilitation.*



**Hermano Igo Krebs, PhD**, Principal Research Scientist and Lecturer, Mechanical Engineering Department, MIT; Adjunct Professor, University of Maryland School of Medicine, Department of Neurology  
*Internationally recognized in the field of Robotics, Dr. Krebs acts as a Visiting Professor at Universities in Japan and the UK. He founded Motion Technologies & 4Motion Robotics to revolutionize the way rehabilitation medicine is practiced today by applying robotics & information technology to assist, enhance, & quantify rehabilitation.*



**Louis Awad, PT, DPT, PhD**, Director, Neuromotor Recovery Laboratory, Assistant Professor, Physical Therapy and Rehabilitation Sciences, Boston University, Boston, MA  
*Dr. Awad is also a Research Faculty Member at Spaulding Rehabilitation Hospital, Founding Faculty Member of the Harvard Assistive Technology Initiative, Associate, Department of Physical Medicine & Rehabilitation at Harvard Medical School and Associate, Paulson School of Engineering & Applied Sciences at Harvard University. He is a member of the Scientific Advisory Boards for ReWalk Robotics and MedRhythms.*



**Jess Lonner, MD**, Professor, Department of Orthopedic Surgery, Rothman Institute, Sidney Kimmel Medical College, Thomas Jefferson University Hospital, Philadelphia, PA, Founder, Ambulatus Robotics, Wynnewood, PA  
*Dr. Lonner specializes in robotic techniques for knee replacement surgery at the Rothman Orthopaedic Institute. He is currently developing a robot for gait training and fall prevention in Orthopaedic patients.*



**Shailesh Kantak, PhD, PT**, Institute Scientist, Director, Neuroplasticity and Motor Behavior Laboratory, Moss Rehabilitation Research Institute  
*Dr. Kantak's research goal is to harness the understanding of motor learning and neuroplasticity to design and test novel interventions in patients with neurologic injuries.*

## Meet the Faculty



**Deborah A. Backus, PhD, FACRM**, Vice President of Research and Innovation, Director of Multiple Sclerosis Research, Shepherd Center, Adjunct Assistant Professor, Emory University, Adjunct Assistant Professor, Georgia Institute of Technology

*Dr. Backus is a grant-funded researcher, physical therapist and educator with more than 30 years of experience in the neurorehabilitation field. She has been instrumental in facilitating clinician involvement in research activities, translation of evidence into clinical practice and uptake of technology into clinical programs.*



**Gerard Francisco, MD**, The Wulfe Family Chair of PM&R, Professor, McGovern Medical School, University of Texas Health Science Center, Chief Medical Officer and Clinical Scientist, TIRR Memorial Hermann, Director UTHealth Neurorecovery Research Center at TIRR Memorial Hermann

*Dr. Francisco's research focuses on the integration of technology in enhancing recovery. Including investigation of non-invasive brain-robot interface for stroke, vagal nerve stimulation to augment post-stroke upper limb rehabilitation, and lower limb wearable exoskeletons for stroke, spinal cord injury and multiple sclerosis.*



**Ning Cao, MD**, Co-Director, Stroke Rehabilitation, MossRehab

*Dr. Cao has worked as a clinician, researcher and educator in the area of stroke rehabilitation and recovery. Dr. Cao is a member of the Association of Academic Physiatrists, the American Academy of PM&R and the International Spine Intervention Society.*



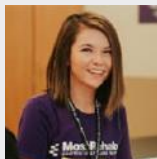
**Andrew Packel, PT, NCS**, Physical Therapist, Stroke Rehabilitation, MossRehab

*Andy is a board-certified specialist in neurologic physical therapy and is currently the Locomotor Coordinator at MossRehab. His primary areas of interest are optimizing interventions to improve walking, including the use of robotics and technology; and enhancing clinical reasoning in therapy practice through explicit consideration of the components of therapy.*



**Jaun May, OTR/L**, Occupational Therapist, Team Leader, Inpatient Stroke Program, MossRehab

*Jaun is an occupational therapist at MossRehab with 18 years of experience. She is practicing clinician on the inpatient stroke program. Jaun participates in various research projects with MRRRI such as home-based mirror therapy, Transport II, and telerehab.*



**Casey McKee, OTR/L**, Occupational Therapist, MossRehab

*Casey has been a practicing occupational therapist for 7 years, the majority in outpatient neurorehabilitation. Her treatment is heavily involved in robotic training. She has published research regarding robotic training and is currently a treatment provider in an ongoing telerehabilitation computer-based study.*

## Meet the Faculty



**David Reinkensmeyer, PhD**, Professor, Mechanical & Aerospace Engineering, School of Engineering, Univ. of CA, Irvine

*Dr. Reinkensmeyer is a co-inventor of the ArmeoSpring arm training exoskeleton and the MusicGlove finger training device. He is a fellow of the AIMBE. His research activities focus on movement control, neuro-rehabilitation and robotics.*



**Amanda Therrien, PhD**, Institute Scientist, Director of the Sensorimotor Learning Lab, Moss Rehabilitation Research Institute

*Dr. Therrien is interested in understanding the precise mechanisms through which damage to different brain areas disrupts sensorimotor function and motor learning. The main focus of her work is understanding mechanisms of sensory and motor impairment caused by damage to the cerebellum.*



**Aaron Wong, PhD**, Institute Scientist, Director, Cognitive Motor Learning Laboratory, Moss Rehabilitation Research Institute

*Dr. Wong is interested in understanding how cognition and the motor system interact when planning movements or learning new skills, with the long-term goal of applying that understanding to more effectively rehabilitate individuals with movement disorders resulting from injury or neurodegenerative disease.*



**Steven Cramer, MD, MMSc, FAAN, FAHA**, Susan and David Wilstein Endowed Chair in Rehabilitation, Professor, Department of Neurology, David Geffen School of Medicine at UCLA, Medical Director of Research, California Rehabilitation Institute, Los Angeles, CA

*Dr. Cramer is a stroke neurologist whose research focuses on neural repair after central nervous system injury in humans, with an emphasis on stroke and on the recovery of movement. A major emphasis is utilizing robotic devices to reduce disability after stroke, and on individualizing therapy for each person's needs.*



**Laurel Buxbaum, PsyD**, Associate Director, Moss Rehabilitation Research Institute and Director Cognition and Action Laboratory. *Dr. Buxbaum has served as an Associate Editor of Cortex, Cognition, and Journal of Neuropsychology, and is the recipient of career awards from the American Society of Neurorehabilitation and the International Neuropsychological Society. She developed virtual reality tasks used in NIH-funded studies of spatial neglect and phantom limb pain.*



**James Finley, PhD**, Associate Professor, Division of BioKinesiology and Physical Therapy, University of Southern California :

*Dr. Finley directs the Locomotor Control Lab and co-directs the USC SensoriMotor Assessment and Rehabilitation Training Center (SMART-VR Center). The ultimate goal of his work is to design novel & effective interventions to improve walking ability in individuals with damage to the nervous system.*



## Meet MossRehab Clinicians



**Samantha Adams, OTR/L, BCPR, Occupational Therapist, Drucker Brain Injury Outpatient Center**

*Samantha is an Occupational Therapist on the Outpatient Brain Injury service. She completed the MossRehab Occupational Therapy Residency Program and received Board Certification in Physical Rehabilitation.*



**Erika Harold, PT, DPT, NCS, Physical Therapist, Stroke Rehabilitation**

*Erika works on the CVA acute inpatient rehab team and is certified level 3 Ekso Trainer through EksoBionics. She completed MossRehab's PT Neurological Residency in 2017-2018 and received her NCS in 2019.*



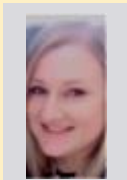
**Elizabeth Marcy, PT, DPT, NCS, Physical Therapist, Drucker Brain Injury Center and Stroke Rehabilitation**

*Elizabeth is the physical therapy team leader for the Stroke and Brain Injury Programs at MossRehab. She is a board certified neurologic specialist, has served as a mentor in the MossRehab Neurologic Residency Program and as adjunct faculty to local physical therapy programs.*



**Alexey Nastaskin, OTR/L, Occupational Therapist, Outpatient Clinic**

*With 15 years experience working with the neurologic based population, Alex's specialties include: Intervention models for Right Hemisphere Stroke Population, Upper Extremity Robotic Rehabilitation, & Neurorehabilitation. He is certified in Kinesiotaping, specializing in splinting & casting for spastic & flaccid hemiparesis*



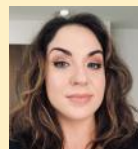
**Samantha Snapp, OTR/L, Occupational Therapist, Stroke Rehabilitation**

*Samantha has 10 years experience and currently works on the inpatient stroke program at MossRehab. She has a special interest in neurologic upper extremity rehabilitation and participates in the TRANSPORT II research project with Moss Rehabilitation Research Institute.*



**Nicole Sosa, PT, DPT, Physical Therapy Team Leader, Comprehensive Rehabilitation Unit**

*Nikki treats patients with cardiac and pulmonary diseases, amputations, orthopedic and polytrauma injuries as well as patients with chronic illnesses and neurological diseases. She has obtained her American Board of Physical Therapy Specialty Certification in Cardiovascular and Pulmonary Physical Therapy.*



**Stephanie Stein, OTR/L, Occupational Therapist, Stroke Rehabilitation**

*In her practice, Stephanie has worked with patients who have sustained a stroke, traumatic brain injury, and other neurological conditions for over 10 years. Her clinical interests include robotics and upper extremity motor recovery after stroke or traumatic brain injury.*

Speaker Disclosures can be found on the website

[www.mossrehab.com/continuingeducation](http://www.mossrehab.com/continuingeducation).

## Meet MossRehab Clinicians



**Matthew Vnenchak, MS, PT, NCS, Physical Therapist, Stroke Rehabilitation**—Matt is a physical therapist with over 20 years' experience who specializes in neurorehabilitation and vestibular rehabilitation. He actively incorporates technology and robotics into his clinical care and lectures on translation of technology to the clinic.



**Joseph Woltemate, MOT, OTR/L, Occupational Therapist, Spinal Cord Injury Program, MossRehab**  
Joe is an occupational therapist working with the spinal cord injury population at MossRehab for the past three years. He also works as a Homecare OT for Einstein Montgomery Home Health and Hospice.

## Registration

Registration and payment can be made online at [www.mossrehab.com/continuingeducation](http://www.mossrehab.com/continuingeducation) (search for Robotics and Technology in Rehabilitation Symposium and click the Register button);

Deadline to register: **Wednesday, September 30, 2021**

If you have any special needs that we can address to make your participation more meaningful and enjoyable, please contact us at 215-663-6457.

-----

**Fees:** \$400 in person    \$350 online    \$100 Student

Discounts for Full-time/Part-time MossRehab Employees and MossRehab Per Diems—virtual attendance only

**Cancellation Policy:** All cancellations must be submitted to MossRehab at [WallacSh@einstein.edu](mailto:WallacSh@einstein.edu). Requests received 3 days or 72 hours prior to course start will result in a full refund. Requests received less than 3 days (72 hours) prior to the course start will result in a non-refundable administration processing fee of \$50. No shows or cancellations within 24 hours of the course start will be ineligible for a refund.

- ⇒ Advanced registration is required due to space limitations. Registration is on a first-come, first-served basis.
- ⇒ For questions about the program or registration, please contact **Sheila Wallace, [WallacSh@einstein.edu](mailto:WallacSh@einstein.edu) or by phone 215-663-6457.**

## Continuing Education Credits

**Requirement for successful course completion:** Satisfactory completion of the continuing education units consists of monitored sign in and sign out forms and completion of a course feedback form that includes self-assessment of learning outcomes. Online attendance will be tracked and completion of an evaluation form and test will be required.

**CME Accreditation Statements:** Einstein Medical Center Philadelphia is accredited by the Pennsylvania Medical Society to provide Continuing Medical Education for physicians.

**CME Credit Designation Statement:** Einstein Medical Center Philadelphia designates this live educational activity for a maximum of 11.0 *AMA PRA Category 1 Credit(s)*<sup>™</sup>. Physicians should only claim credit commensurate with the extent of their participation in the educational activity.

**Conflict of Interest Statement:** Faculty and all others who have the ability to control the content of continuing medical education activities sponsored by Einstein Medical Center Philadelphia are expected to disclose to the audience whether they do or do not have any real or apparent conflict(s) of interest or other relationships related to the content of their presentation(s).

**Accreditation Statement For Psychologists:** Einstein Healthcare Network is approved by the American Psychological Association to sponsor continuing education for psychologists. Einstein Healthcare Network maintains responsibility for this program and its content.

**Credit Designation Statement:** This program offers up to Eleven (11) Continuing Education credits. **CE Program Administrator:** Brian Gallagher, Psy.D., Phone: 215.456.9850 Email: [gallagbr@einstein.edu](mailto:gallagbr@einstein.edu),

**Physical Therapy CEUs:** Application has been submitted for 12.5 contact hours to Pennsylvania State Board of Physical Therapy and New Jersey State Board of Physical Therapy Examiners. MossRehab is an approved provider of Physical Therapy through the New York State Education Department.

### American Occupational Therapy Association (AOTA):



MossRehab is an approved provider of continuing education. Course Approval # 2998. This Blended/Hybrid format is offered at .125 CEUs Intermediate level and Occupational Therapy Service Delivery, Professional Issues, Foundational Knowledge categories. AOTA does not endorse specific course content, products, or clinical procedures.

# Robotics and Technology in Rehabilitation Symposium

Friday, October 8 and  
Saturday, October 9, 2019

Hosted by  
MossRehab and  
Moss Rehabilitation Research  
Institute  
60 Township Line Road  
Elkins Park, PA 19027



Non Profit Org.  
US Postage  
**PAID**  
LISTMASTERS