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‘Delft University of Technology, ‘University of Twente

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Rice University

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‘Massachusetts Institute of Technology, ‘North Carolina State University

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Morgan K. Boes¹, Mazharul Islam¹, Yifan David Li², Elizabeth T. Hsiao-Wecksler³
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¹NHS Grampian, ²University of Leeds, ³University of Salford

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¹Rehabilitation Institute of Chicago/Northwestern University, ²Northwestern University, ³Rehabilitation Institute of Chicago

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1University of Toronto, 2Toronto Rehabilitation Institute, 3University of Toronto & Toronto Rehabilitation Institute, 4Quanser Inc.

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Monday, June 24, 2013

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Haoyong Yu1, Sunan Huang1, Gong Chen1, Nitish Thankor1, Siew-Lok Toh1, Manolo STA Cruz2, Yassine Ghorbel3, Chi Zhu4

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Fabrizio Sergi, Melissa M. Lee, Marcia K. O’Malley

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Queen’s University

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National University of Singapore

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Enhao Zheng1, Long Wang1, Yimin Luo1, Kunlin Wei1, Qining Wang1

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National University of Singapore

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Kamran Shamaei, Paul Napolitano, Aaron Dollar

Yale University

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Stevens Institute of Technology

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Christophe Everaerts1, Heike Vallery1, Marc Bolliger1, Renaud Ronsse1

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*Wietse van Dijk¹, Bram Koopman², Edwin van Asseldonk², Herman van der Kooij²*
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*Andrew Pennycott, Heike Vallery, Dario Wyss, Markus Spindler, Antoine Dewarrat, Robert Riener*
ETH Zurich

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*Gerard Dunning and Just Herder*
Delft University of Technology

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*Wanjoo Park¹, Wookjin Jeong¹, Gyu-Hyun Kwon¹, Yun-Hee Kim², Laehyun Kim¹*
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*Hee-Tae Jung¹, Takeshi Takahashi¹, Yu-Kyong Choe¹, Jennifer Baird², Tammie Foster³, Roderic Grupen¹*
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*Je Hyung Jung, David Valencia, Cristina Rodríguez-de-Pablo, Thierry Keller, Joel Perry*
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*Urs Keller, Georg Rauter, Robert Riener*
Sensory-Motor Systems Lab, ETH Zürich, Switzerland

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*Timothy Exell, Christopher Freeman, Katie Meadmore, Ann-Marie Hughes, Emma Hallewell, Mustafa Kutlu, Jane Burridge, Eric Rogers*
University of Southampton

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*Thijs Krabben¹, Jaap H Buurke², Gerdienke B Prang³, Johan S Rietman²*
¹Roessingh Research & Development, ²University of Twente
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Dalia De Santis¹, Lorenzo Masi², Pietro Morasso¹, Valentina Squeri¹, Jacopo Zenzeri¹, Maura Casadoro¹, Psiche Giannoni³, Assunta Riva⁴
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University of Lübeck, Germany

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J. Houdijn Beekhuis, Ard J. Westerveld, Herman van der Kooij, Arno H.A. Stiene¹
University of Twente

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Serdar Ates¹, Joan Lobo-Prat³, Piet Lammertse⁵, Herman van der Kooij², Arno H. A. Stienen¹
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Domen Novak and Robert Rieger
ETH Zurich, Sensory-Motor Systems Lab

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Claudio Castellini¹ and Risto Kõiva²
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¹Georgia Institute of Technology, ²Redwood Robotics, Inc

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Amir B. Farjad, Mark L. Sivak, Constantinos Mavroidis
Northeastern University

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Xi Chen¹, Christina Ragonesi², James Galloway³, Sunil Agrawal⁴
¹University of Delaware, ²Columbia University

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Hoang H. Le¹, Rui C.V. Loureiro¹, Florian Dussopt², Nicholas Phillips³, Aleksander Zivanovic⁴, Martin J. Loomes¹
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¹Kanagawa Institute of technology, ²Coventry University

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¹Mie University, ²Gifu University

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¹Kwansei Gakuin Univ., ²RIKEN,³Setsunan Univ., ⁴Advanced Inst. of Industrial Tech.
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Cheng-Shiu Chung, Hongwu Wang, Rory Cooper
University of Pittsburgh

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Beomsoo Hwang and Doyoung Jeon
Sogang University

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Jaimie Borisoff, Johanne Mattie, Vince Rafer
British Columbia Institute of Technology

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Zeynep Dogmus1, Agis Papantoniou2, Muhammed Kilinc3, Sibel Yildirim1, Esra Erdem1, Volkan Patoglu1
1Sabanci University, 2National Technical University of Athens, 3Hacettepe University

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Sung Yul Shin1, Jung Yoon Kim2, Sanghyeop Lee2, Junwon Lee2, Seung-Jong Kim2, ChangHwan Kim2
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Nathanael Jarrassé1, Markus Kuehne1, Nick Roach2, Asif Hussain1, Sivakumar Balasubramanian1, Etienne Burdet2, Agnès Roby-Brami1
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2Department of Bioengineering, Imperial College of Science, Technology and Medicine,
Tecnalia, Derio (Bizkaia), Spain

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Hamed Kazemi, Robert Kearney, Theodore Milner
McGill University

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Sayyed Mostafa Mostafavi1, Janice Glasgow1, Stephen Scott2, Sean Dukelow2, Parvin Mousavi1
1Queen’s University, 2University of Calgary

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Matt Simkins1, Hyunchul Kim1, Gary Abrams2, Nancy Byl2, Jacob Rosen1
1UCSC, 2UCSF
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J.M.N. (Hans) Essers¹, Alessio Murgia², Arjen Bergsma³, Paul Verstegen¹, Kenneth Meijer¹
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Selma Sabanovic¹, Casey Bennett², Wan-Ling Chang¹, Lesa Huber¹
¹Indiana University, ²Indiana University; Centerstone Research Institute

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Jaime Valls Miro¹, Ross Black², Bojan Andonovski², Gamini Dissanayake²
¹UTS, ²Prince of Wales Hospital

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Filippo Cavallo¹, Carlo Maremmani², Dario Esposito¹, Erika Rovini¹, Michela Aquilano¹, Paolo Bongioanni², Maria Chiara Carrozza², Paolo Dario¹
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Andrew Jackson¹, Martin Levesley¹, Sophie Makower¹, Alastair Cozens³, Bipinchandra Bhakta¹
¹University of Leeds, ²Leeds Community Healthcare NHS Trust, ³Grampian NHS, ⁴Leeds Teaching Hospitals Trust, UK

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Stefano Mazzoleni¹, Patrizio Sale¹, Micol Tiboni², Marco Franceschini², Maria Chiara Carrozza¹, Federico Posteraro¹
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Momotaz Begum¹, Rosalie Wang¹, Rajibul Huq², Alex Mihailidis²
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Sandra Bedaf², Gert Jan Gelderblom¹, Luc de Witte², Dag Syrdal³, Hagen Lehmann², Farshid Amirabdollahian², Kerstin Dautenhahn², David Hewson³
²Zuyd University of Applied Sciences, ³University of Hertfordshire, ⁴University of Technology of Troyes
**Poster Session D**

Tuesday, June 25, 2013

**D1**

Ankle-Knee Prosthesis with Powered Ankle and Energy Transfer for CYBERLEGs a-Prototype

Joost Geeroms, Louis Flynn, Rene Jimenez-Fabian, Bram Vanderborght, Dirk Lefeber

Vrije Universiteit Brussel

**D2**

Strategies to reduce the configuration time for a powered knee and ankle prosthesis across multiple ambulation modes

Ann Simon, Nicholas Fey, Suzanne Finucane, Robert Lipschutz, Levi Hargrove

‘Center for Bionic Medicine, Rehabilitation Institute of Chicago and Department of Physical Medicine and Rehabilitation, Northwestern University, ‘Center for Bionic Medicine, Rehabilitation Institute of Chicago

**D3**

Effects of a powered ankle-foot prosthesis on kinetic loading of the contralateral limb: A case series

David Hill and Hugh Herr

Massachusetts Institute of Technology

**D4**

Clutchable Series-Elastic Actuator: Design of a Robotic Knee Prosthesis for Minimum Energy Consumption

Elliott Rouse, Luke Mooney, Ernesto Martinez-Villalpando, Hugh Herr

MIT

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EMG Control of a Bionic Knee Prosthesis: Exploiting Muscle Co-Contraction for Improved Locomotor Function

James Dawley, Kevin Fite, George Fulk

Clarkson University
D6 Modeling of WalkMECH: a Fully-Passive Energy-Efficient Transfemoral Prosthesis Prototype
Ramazan Unal, Feite Klijnstra, Bram Burkink, Sebastiaan Behrens, Edsko Hekman, Stefano Stramiglio, Bart Koopman, Raffaella Carloni
University of Twente

D7 Novel Knee Joint Mechanism of Transfemoral Prosthesis for Stair Ascent
Koh Inoue¹, Takahiro Wada², Ryuichi Harada¹, Shinichi Tachiwana¹
¹Kagawa University, ²Ritsumeikan University

D8 Redefining Prosthetic Ankle Mechanics, Non-Anthropomorphic Ankle Design
Andrew LaPre and Frank Sup
University of Massachusetts Amherst

D9 Novel Differential Mechanism Enabling Two DOF from a Single Actuator: Application to a Prosthetic Hand
Joseph Belter and Aaron Dollar
Yale University

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Luke Mooney and Hugh Herr
MIT

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Hao Zheng and Xiangrong Shen
The University of Alabama

D12 Multimodal Sensor Controlled Three Degree of Freedom Transradial Prosthesis
Kengo Ohnishi¹, Isamu Kajitani², Toshiyuki Morio³, Tomoo Takagi³
¹Tokyo Denki University, ²National Inst. of Adv Industrial Science & Technology, ³Okayama Prefectural University

D13 Proportional EMG Control of Ankle Plantar Flexion in a Powered Transtibial Prosthesis
Jing Wang, Oliver A. Kannape, Hugh M. Herr
Massachusetts Institute of Technology

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Mahdy Eslamy, Martin Grimmer, Stephan Rinderknecht, Andre Seyfarth
TU Darmstadt

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Rehabilitation Institute of Chicago
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JOHN JAIRO VILLAREJO MAYOR, JHON FREDDY SARMIENTO VELA, ANSELMO FRIZERA NETO, TEODIANO FREIRE BASTOS FILHO  
Universidade Federal do Espírito Santo

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Manfredo Atzori1, Micheal Baechler2, Henning Müller1  
1University of Applied Sciences Western Switzerland, 2University of Fribourg

**D18**  
**A synergy-driven approach to a myoelectric hand**  
Sasha Blue Godfrey1, Arash Ajoudani1, Manuel Catalano2, Giorgio Grioli2, Antonio Bicchi1  
1Istituto Italiano di Tecnologia, 2University of Pisa and Istituto Italiano di Tecnologia

**D19**  
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Minas Liarokapis1, Panagiotis Artemiadis1, Kostas Kyriakopoulos1  
1National Technical University of Athens, 2Arizona State University

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Risto Köiva1, Barbara Hilsenbeck2, Claudio Castellini2  
1Bielefeld University, 2DLR - German Aerospace Center

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Berno J.E. Misgeld1, Daniel Rueschen1, Saim Kim2, Steffen Leonhardt1  
1RWTH Aachen University, 2MELAG Medizintechnik oHG

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Michael Tucker, Adrian Moser, Olivier Lambercy, James Sulzer, Roger Gassert  
ETH Zurich

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Ding Wang, Ming Liu, Fan Zhang, He Huang  
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University of Alberta

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1Johns Hopkins University, 2Kennedy Krieger, Johns Hopkins School of Medicine, 3Stanford University
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1Rehabilitation Institute of Chicago, 2Northwestern University

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1Department of Mechanical Engineering, Stanford University, 2Kennedy Krieger Institute and Department of Neuroscience, Johns Hopkins University

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1CEA-LIST, 2APPROCHE, 3CHU Montpellier, 4LIMSI, 5Institut PASCAL, 6ROBOSOFT

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National Rehabilitation Center, Korea

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Université catholique de Louvain

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LAAS-CNRS

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Arizona State University

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André Wilkening1 and Oleg Ivlev2
1FWBI Friedrich-Wilhelm-Bessel-Institute Research Company and University of Bremen, Institute of Automation, 2Friedrich-Wilhelm-Bessel-Institute Research Company

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David Baiden1 and Oleg Ivlev2
1Friedrich-Wilhelm-Bessel-Institute and University of Bremen, Institute of Automation, 2Friedrich-Wilhelm-Bessel-Institute

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1Nagoya University, 2Minami Seikyo Hospital

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Vineet Vashista1, Darcy Reisman1, Sunil Agrawal1
1Columbia University, 2University of Delaware

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1University of Kaiserslautern, 2University of Brasilia

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Yifan Li and Elizabeth Hsiao-Wecksler
UIUC
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Alice De Luca¹, Carmelo Lentino¹, Honorè Vernetti², Giovanni Antonio Checchia¹, Psiche Giannoni², Pietro Morasso³, Maura Casadio⁴

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Jos Meuleman¹, Edwin van Asseldonk², Herman van der Kooij²

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Jung Jun-Young¹, Park Hyunsub¹, Yang Hyun-Dae², Chae Mingi²

¹Korea Institute of Industrial Technology, ²University of Science and Technology

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Takashi Watanabe, Takuya Murakami, Yasunobu Handa

Tohoku University

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Loek van der Heide¹, Gert-Jan Gelderblom², Luc de Witte³

¹Zuyd University of Applied sciences and School for public health and primary care, ²Zuyd University of applied sciences

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Richard L. Smith, Joan Lobo-Prat, Herman van der Kooij, Arno H.A. Stienen

University of Twente

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Elizabeth Brokaw¹, Peter Lum², Rory Cooper³, Bambi Brewer³

¹The University of Pittsburgh, ²The Catholic University of America and the National Rehabilitation Hospital, ³The Department of Veteran Affairs and the University of Pittsburgh
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Fukui University of Technology

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¹Catholic University of America, ²National Institutes of Health

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Non-Contact versus Contact-based Sensing Methodologies for In-Home Upper Arm Robotic Rehabilitation
Ayanna Howard¹, Douglas Brooks¹, Edward Brown², Adey Gebregiorgis³, Yu-Ping Chen³
¹Georgia Institute of Technology, ²Rochester Institute of Technology, ³Georgia State University

Application of arm support training in sub-acute stroke rehabilitation: first results on effectiveness and user experiences
Gerdienke B. Prange, Anke I. R. Kottink, Jaap H. Buurke, Johannes S. Rietman
Roessingh Research and Development

Assessment of upper limb motor function in patients with Multiple Sclerosis using the Virtual Peg Insertion Test: a pilot study
Olivier Lambercy¹, Marie-Christine Fluet¹, Ilse Lamers², Lore Kerkhofs³, Peter Feys², Roger Gassert¹
¹ETH Zurich, ²Hasselt University, ³Rehabilitation & MS Center Overpelt

The Manumeter: A non-obtrusive wearable device for monitoring spontaneous use of the wrist and fingers
Justin Rowe, Nizan Friedman, Mark Bachman, David Reinkensmeyer
University of California, Irvine

Effort, performance, and motivation: Insights from robot-assisted training of human golf putting and rat grip strength
Jaime Duarte, Berkey Gebrekristos, Sergi Perez, Justin Rowe, Kelli Sharp, David Reinkensmeyer
University of California, Irvine

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Actuators And Hand Exoskeleton Design
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Session Chairs: Farshid Amirabdollahian and Roger Gassert

A Pediatric Robotic Thumb Exoskeleton for at-Home Rehabilitation The Isolated Orthosis for Thumb Actuation (IOTA)
Patrick M. Aubin¹, Hani Sallum¹, Conor Walsh¹, Annette Correia², Leia Stirling¹
¹The Wyss Institute at Harvard University, ²Boston Children's Hospital

CARAPACE: a novel Composite Advanced Robotic Actuator Powering Assistive Compliant Exoskeleton: Preliminary Design
Lorenzo Masi¹, Xavier Lachenal¹, Alberto Pirre², Leonardo Cappello¹, Filippo Mattioni³, Paul Weaver², Pietro Morasso¹
¹Istituto Italiano di Tecnologia, ²University of Bristol, ³Hengshen Carbon Fibre
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1School of Mechanical and Aerospace Engineering, Nanyang Technological University, Singapore, 2Institute of Intelligent Systems and Robotics, University Pierre et Marie Curie, CNRS - UMR 7222, 3Department of Bioengineering, Imperial College of Science, Technology and Medicine, London

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1ETH Zurich, 2Zurich University of the Arts

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1University of Massachusetts Lowell, 2Crotched Mountain Rehabilitation Center

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1Rehabilitation Institute of Chicago, 2Northwestern University

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¹Northwestern University/Rehabilitation Institute of Chicago, ²Rehabilitation Institute of Chicago

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¹University of Texas at Dallas, ²Rehabilitation Institute of Chicago

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¹University of Illinois Urbana-Champaign, ²University of Minnesota

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¹TU Delft, The Netherlands, ²Lutz Medical Engineering, Switzerland, ³EPFL Lausanne, Switzerland, ⁴ETH Zurich, Switzerland, ⁵Khalifa University, UAE, ⁶ULouvain, Belgium, ⁷University of Zurich, Switzerland

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¹Univ. of Delaware, ²Rehabilitation Institute of Chicago, ³Columbia University
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¹Swiss Federal Institute of Technology, ETHZ, ²Zurich University Hospital for Psychiatry and the Department of Child and Adolescent Psychiatry, ³University of Zurich and ETHZ, ⁴University Hospital Zurich, ⁵Zurich University Hospital for Psychiatry

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¹Northwestern University and Rehabilitation Institute of Chicago, ²University of Illinois at Chicago, & the Rehabilitation Institute of Chicago