

# Friday 19 Oct

8.30-9:20	ICNR-WeRob Plenary #6 - Prof. M. Chiara Carrozza: Human-Robot integration to support Cognitive and Physical Rehabilitation			
9:20-9:40	Sponsor's Spotlight Demonstration: OTBioelettronica			
9:40-11:10	<b>ICNR Sessions</b>			<b>WeRob Sessions</b>
	ICNR - T1 - SS4. New perspectives in upper limb prosthetics: from the robotics laboratory to clinical use	ICNR - T2 - SS11. Redundancy and modularity in motor control: neuroscience, prosthetic, rehabilitative and assistive approaches	ICNR - T4 - SS24. Array electrode for the assessment of muscle functions: When, where and why?	WeR10. Smart human-machine systems for lower-limb assistance and rehabilitation after paralysis
11:10-11.30	Coffee break - Project demo: Spexor			
11.30-13:00	<b>ICNR Sessions</b>			<b>WeRob Sessions</b>
	ICNR - T1 - SS4. New perspectives in upper limb prosthetics: from the robotics laboratory to clinical use	ICNR - T2 - SS7. Shaping robotic training to maximize patient outcome: new trends and perspectives	ICNR - T4 - SS20. Application of Functional Electrical Stimulation (FES) to lower limb movement assistance	WeR11. Biorobotics approaches to understand and restore human balance
13:00-14:10	Lunch			
14:10-15:00	ICNR-WeRob Plenary #7 - Prof. Herman van der Kooij: Human Inspired control of exoskeletons			
15:00-16:30	<b>ICNR Sessions</b>			<b>WeRob Sessions</b>
	ICNR- T1 -SS3. Computer Models in the Design of Neurotechnologies and Rehabilitation Tools	ICNR - T3 - SS18. Cognitive approaches for rehabilitation of patients with neurological disorders	ICNR - T4 - SS21. Uncovering neural mechanisms of post-stroke recovery using clinical imaging tools	WeR1. Wearable sensors for robotic exoskeletons WeR6. Flexible and Transparent Technologies for Innovative Wearable Robotics
16.30-17.30	Coffee break and poster session: Project demo: IIT Inail Exoskeleton			
17:30-18:00	<b>Awards</b>			
18:00-18:15	<b>Closing ceremony</b>			

### ICNR- T1 -SS3. Computer Models in the Design of Neurotechnologies and Rehabilitation Tools – Room Auditorium

#### Organizer

Marco Capogrosso

Authors	Title
Scott Lempka, Hans Zander, Carlos Anaya, Alexandria Wyant, John Ozinga and Andre Machado	Model-based Analysis of Spinal Cord Stimulation for Chronic Pain
Nathan Greiner and Marco Capogrosso	Anatomically Realistic Computational Model to Assess the Specificity of Epidural Electrical Stimulation of the Cervical Spinal Cord
Stanisa Raspopovic and Francesco Petrini	A computational model for a design of lower-limb sensorimotor neuroprostheses
Massimo Sartori, Guillaume Durandau, Strahinja Dosen and Dario Farina	Decoding phantom limb neuro-mechanical function for a new paradigm of mind-controlled bionic limbs
Matteo Saponati, Giulio Ceccarelli, Enrico Cataldo and Alberto Mazzoni	A simple and complete model of thalamocortical interactions for neuroengineering applications

### ICNR - T1 - SS4. New perspectives in upper limb prosthetics: from the robotics laboratory to clinical use – Room Auditorium

#### Organizers

Antonio Bicchi, Matteo Bianchi, Manuel Giuseppe Catalano

Authors	Title
Christian Cipriani	Non-invasive, temporally discrete feedback improves grasp control of closed-loop myoelectric transradial prostheses
Marco Santello	Optimizing performance of a force-feedback-enabled, soft-synergy-based prosthetic hand
Kristin Zhao	SoftHand Pro, a clinical assessment
Marcia O'Malley	Haptic Feedback for Intuitive Prosthesis Control,
Eike Jakobowitz	Testing the SoftHand Pro – Clinical Insights from and with Experienced Myoelectric Prosthesis User
Giuseppe Averta, Edoardo Battaglia, Cosimo Della Santina, Manuel Giuseppe Catalano and Matteo Bianchi	A synergistic behavior underpins human hand grasping force control during environmental constraint exploitation
Sigrid Dupan, Ivan Vujaklija, Martyna Stachaczyk, Janne Hahne, Dick Stegeman, Strahinja Dosen and Dario Farina	Online simultaneous myoelectric finger control

Cristina Piazza, Manuel Catalano, Antonio Bicchi and Levi Hargrove

Alireza Mohammadi, Jim Lavranos, Peter Choong and Denny Oetomo

Giacomo Valle, Silvestro Micera and Alberto Mazzoni

Linda Paternò, Michele Ibrahimi, Elisa Rosini, Leonardo Ricotti and Arianna Menciassi

Preliminary Results Toward Continuous and Proportional Control of a Multi-Synergistic Soft Prosthetic Hand

X-Limb: A Soft Prosthetic Hand with User-friendly Interface

Long-term exploitation of intraneural stimulation in three trans-radial amputees

Residual limb volume changes in transfemoral amputees due to physical activity

### ICNR - T2 - SS7. Shaping robotic training to maximize patient outcome: new trends and perspectives – Room Pacinotti

#### Organizers

Roberto Colombo, Vittorio Sanguineti

#### Authors

#### Title

Roberto Colombo, Alessandra Mazzone, Carmen Delconte and Alfredo Raglio

Patient Motivation and Rewarding to Maximize Outcome: a Sensory Perspective

Patrizio Sale

Use of EEG signal information to optimize training and promote plasticity

Sara Contu, Angelo Basteris, Tegan K Plunkett, Christopher Wk Kuah, Karen S Chua, Domenico Campolo and Lorenzo Masia

Evolution of proprioceptive dysfunctions after stroke: insights from robotic metrics

Martina Coscia, Laura Pellegrino, Camilla Pierella, Elvira Pirondini, Nawal Kinany, Jenifer Miehlbradt, Cecile Magnin, Pierre Nicolo, Psiche Giannoni, Lucio Marinelli, Adrian Guggisberg, Maura Casadio and Silvestro Micera

Training muscle synergies to relearn movement: current perspectives and future trends

Andrés Úbeda, Alessandro Del Vecchio, Ivan Vujaklija and Dario Farina

Analysis of intramuscular motor unit coherence in the tibialis anterior muscle as a tool for the assessment of robot-assisted rehabilitation

Vittorio Sanguineti, Giulia Sedda, Rita Franzosi, Alessandra Mazzone and Roberto Colombo

Robot assisted exercise: modelling the recovery process to personalise therapy

### ICNR - T2 - SS11. Redundancy and modularity in motor control: neuroscience, prosthetic, rehabilitative and assistive approaches – Room Pacinotti

**Organizers**

Diego Torricelli, Cristiano De Marchis, Andrea D'Avella, Leonardo Cappello

**Authors****Title**

Michele Xiloyannis, Letizia Galli, Domenico Chiaradia, Antonio Frisoli, Francesco Braghin and Lorenzo Masia

A Soft Tendon-Driven Robotic Glove: Preliminary Evaluation

Elisabetta Peri, Emilia Ambrosini, Cristiano De Marchis, Claudia Nava, Luca Longoni, Alessandra Pedrocchi, Giorgio Ferriero and Simona Ferrante

Does cycling training augmented by Functional Electrical Stimulation impact on muscle synergies in post-acute stroke patients?

Tomas A. Lenssen, Leonardo Cappello, Dick H. Plettenburg, Christian Cipriani and Marco Controzzi

Principal orientations of the wrist during ADLs: towards the design of a synergetic wrist prosthesis

Giuseppe Averta, Franco Angelini, Antonio Bicchi, Gaetano Valenza and Matteo Bianchi

On the Role of Postural Synergies for Grasp Force Generation and Upper Limb Motion Control

Dalia De Santis and Ferdinando Mussa-Ivaldi

Guiding the reorganization of motor redundancy for assistance and rehabilitation after spinal cord injury

Francesco Scotto di Luzio, Francesca Cordella, Clemente Lauretti, Francesco Draicchio and Loredana Zollo

Assessment of muscular activation patterns in 3D upper limb robot-aided rehabilitation

**ICNR - T3 - SS18. Cognitive approaches for rehabilitation of patients with neurological disorders – Room Pacinotti****Organizer**

Francisco Molina Rueda

**Authors****Title**

Lizbeth Peralta-Malvárez and Gibran Etcheverry

Individual Alpha Peak Frequency's Dataset through Neurofeedback's protocol

Matteo Morando, Silvana Dellepiane, Francesca Cecchi, Giorgia Giannarelli and Serena Olivieri

Monitoring Home-Based Activity of Stroke Patients: A Digital Solution for Visuo-Spatial Neglect Evaluation

Martina Maier, Sock Ching Low, Belén Rubio Ballester, Nuria Leiva Bañuelos, Esther Duarte Oller and Paul F. M. J. Verschure

Depression Modulates Attentional Processing after Stroke

Leonardo Martini, Laura Fabbri, Silvia Pancani, Irene Mosca, Filippo Gerli and Federica Vannetti

Preliminary investigation of a newly developed tele-rehabilitation program for people living with MCI condition

Elisa Pedroli, Silvia Serino, Pietro Cipresso, Gianluca De Leo, Karine Goulene, Sandra Morelli, Giuseppe D'Avenio, Marco Stramba-Badiale, Mauro Grigioni, Andrea Gaggioli and Giuseppe Riva

An immersive cognitive rehabilitation program: a case study

**ICNR - T4 - SS20. Application of Functional Electrical Stimulation (FES) to lower limb movement assistance – Room Fermi**

**Organizer**

Christine Azevedo Coste

**Authors**

**Title**

Brian Andrews, Robin Gibbons, Simon Goodey, Adrian Poulton and James Shippen

Towards the Development of Full Motion FES Rowing with Accurate Ergometry: RowStim IV

Constantin Wiesener, Andreas Niedeggen and Thomas Schauer

Electrotactile feedback for FES-assisted swimming

Benoît Sijobert, Charles Fattal, Joanna Pontier and Christine Azevedo Coste

FES-based control of knee joint to reduce stance phase asymmetry in post-stroke gait: feasibility study

Emilia Ambrosini, Simona Ferrante, Monica Parati and Alessandra Pedrocchi

Cycling induced by Functional Electrical Stimulation in Stroke Patients: a systematic review and a meta-analysis of the evidence

Antônio Bó, Ana Claudia Lopes, Lucas Fonseca, Claudia Ochoa-Diaz, Christine Azevedo Coste and Emerson Fachin-Martins

Experimental results and design considerations for FES-assisted transfer for people with spinal cord injury

Filipe Barroso, Bryan Yoder, Josephine Wallner, Maria Jantz, Pablo Tostado, Evonne Pei, Vicki Tysseling, Lee Miller and Matthew Tresch

Cortically controlled FES for restoration and rehabilitation of function following SCI in rats

**ICNR - T4 - SS21. Uncovering neural mechanisms of post-stroke recovery using clinical imaging tools – Room Fermi**

**Organizers**

Nawal Kinany and Elvira Pirondini

**Authors**

**Title**

Pierre Nicolo, Cecile Magnin, Elena Pedrazzini, Armin Schnider and Adrian Guggisberg

Transcranial direct current stimulation reduces secondary white-matter degradation after stroke

Nawal Kinany, Camilla Pierella, Elvira Pirondini, Martina Coscia, Jenifer Miehlbradt, Cécile Magnin, Pierre Nicolo, Dimitri Van De Ville, Adrian Guggisberg and Silvestro Micera

Resting-state functional connectivity in stroke patients after upper limb robot-assisted therapy: a pilot study

Elvira Pirondini, Camilla Pierella, Nawal Kinany, Martina Coscia, Jenifer Miehlbradt, Cecile Magnin, Pierre Nicolo,

On the potential of EEG biomarkers to inform robot-assisted rehabilitation in stroke patients

Adrian Guggisberg, Silvestro Micera, Leon Deouell and Dimitri Van de Ville  
Emma Colamarino, Floriana Pichiorri, Donatella Mattia and Febo Cincotti

Bipolar filters improve usability of Brain-Computer Interface technology in post-stroke motor rehabilitation

#### ICNR - T4 - SS24. Array electrode for the assessment of muscle functions; When, where and why? – Room Fermi

##### Organizers

Dejan B. Popović, Lana Popović Maneski

##### Authors

##### Title

Dejan Popović, Ivan Topalovic, Suzana Dedijer Dujovic and Ljubica Konstantinović

Wearable System for the Gait Assessment in Stroke Patients

Babak Afsharipour, Subaryani Soedirdjo and Roberto Merletti

Eliminating the bottleneck of sEMG recordings: Array electrodes

Jacques Duchateau

Muscle Fatigability: What, Why and How it Constrains Motor Performance

Lana Popovic-Maneski and Ivan Topalovic

EMG Map for Designing the Electrode Shape for Functional Electrical Therapy of Upper Extremities

Jernej Kranjec and Ales Holobar

Advanced signal processing techniques for multi-channel EMG – on the need for motor unit action potential compensation

Catherine Disselhorst-Klug, Sybele Williams and Sylvie von Werder

Surface Electromyography Meets Biomechanics or Bringing sEMG to Clinical Application

Strahinja Dosen, Gauravkumar Patel, Claudio Castellini, Janne Hahne and Dario Farina

A novel physiologically-inspired method for myoelectric prosthesis control using pattern classification

#### WeR1. Wearable sensors for robotic exoskeletons – Room Galilei

##### Organizers

Andrea Mannini and Simona Crea, Assistant Professor, The BioRobotics Institute, Scuola Superiore Sant'Anna

##### Authors

##### Title

Muhammad Raza Ul Islam, Kun Xu and Shaoping Bai

Position sensing and control with FMG sensors for exoskeleton physical assistance

Stefania Russo, Nicola Carbonaro and Alessandro Tognetti	EIT-based tactile sensing patches for rehabilitation and human machine interaction
Qining Wang	Wearable sensors for motion recognition in prosthetic control
Lucia Beccai	Textile based mechanical sensors for wearables
Damiano Zanotto	Machine Learning Regression Improves Accuracy of Footwear-based Systems for Gait Analysis
Grega Logar, Zoran Ivanić and Marko Munih	Wearable sensory apparatus performance while using inertial measurement units

### WeR6. Flexible and Transparent Technologies for Innovative Wearable Robotics – Room C

**Organizers** Anselmo Frizera Neto, Federal University of Espirito Santo (Brazil); Carlos A. Cifuentes, Colombian School of Engineering (Colombia)

Authors	Title
Arnaldo G. Leal-Junior, Anselmo Frizera, Carlos Marques and Maria José Pontes	Development of Polymer Optical Fiber Sensors for Lower Limb Exoskeletons Instrumentation
Miguel Manchola, Daya Serrano, Daniel Gomez, Felipe Ballen, Diego Casas, Marcela Munera and Carlos A. Cifuentes	T-FLEX: Variable Stiffness Ankle-Foot Orthosis for Gait Assistance
Tom Verstraten, Raphaël Furnémont, Pablo López-García, Stein Crispel, Bram Vanderborght and Dirk Lefeber	A Series Elastic Dual-Motor Actuator Concept for Wearable Robotics
Matteo Sposito, Stefano Toxiri, Darwin Gordon Caldwell, Jesus Ortiz and Elena De Momi	Towards Design Guidelines for Physical Interfaces on Industrial Exoskeletons: Overview on Evaluation Metrics
Wilian Miranda Dos Santos and Adriano Siqueira	Design and Control of a Transparent Lower Limb Exoskeleton
Shaoping Bai, Simon Christensen, Muhammad Islam, Sajid Rafique, Nauman Masud, Per Mattsson, Leonard .O'Sullivan and Valerie Power	Development and testing of full-body exoskeleton AXO-SUIT for physical assistance of the elderly

### WeR10. Smart human-machine systems for lower-limb assistance and rehabilitation after paralysis – Room Galilei

**Organizers** Jose Contreras-Vidal (University of Houston IUCRC BRAIN Center, USA); Jose Azorin (Miguel Hernández University of Elche, Spain)

**Authors****Title**

Ann M Spungen, EdD

Update from on-going exoskeletal-assisted walking clinical trials in chronic and acute spinal cord injury

Jose Azorin, Ph.D.

Control of lower-body exoskeletons by combining stimulation and decoding of motor imagery

Jose Contreras-Vidal, Ph.D.

Early findings from the NeuroRex trial: Neural mechanisms of BMI adaptation in smart human-machine systems

Gail F. Forrest, Arvind Ramanujam, Ann M. Spungen, Christopher Cirnigliaro, Kamyar Momeni, Syed R. Husain, Jonathan Augustine, Erica Garbarini, Pierre K. Asselin and Steven Knezevic

Exoskeleton Controller and Design Considerations: Effect on Training Response for Persons with SCI

**WeR11. Biorobotics approaches to understand and restore human balance – Room Galilei****Organizers**

Thomas Mergner, Vittorio Lippi and Diego Torricelli

**Authors****Title**

Thomas Mergner and Vittorio Lippi

Human and Robot Posture Control should be Combined when Neuro-Rehabilitation Devices support Standing Balance

Guillaume Durandau, Herman van der Kooij and Massimo Sartori

A computational framework for muscle-level control of robotic ankle exoskeletons

Xinyao Hu, Chuang Luo, Dongsheng Peng and Xingda Qu

A Conductive Fabric based Smart Insole to Measure the Foot Pressure Distribution with High Resolution

Edwin van Asseldonk, Amber Emmens, Tycho Brug, Iolanda Pisotta, Matteo Arquilla, Federica Tamburella, Marcella Masciullo, Nevio Tagliamonte, Romain Valette, Marco Molinari and Herman van der Kooij

Training balance recovery in people with incomplete SCI wearing a wearable exoskeleton

Andre Seyfarth, Maziar Sharbafi, Guoping Zhao and Christian Schumacher

Modular Composition of Human Gaits Through Locomotor Subfunctions and Sensor-Motor-Maps

Maximo Roa

Model-Based Posture control for a Torque-Controlled Humanoid Robot



## Friday 19 Oct - Poster session

Giacinto Luigi Cerone, Jacopo Filippi and Marco Gazzoni	A tendon-like orthosis actuated by Shape Memory Alloy wires and controlled by myoelectric signals: a single-finger prototype	SS11. Redundancy and modularity in motor control: neuroscience, prosthetic, rehabilitative and assistive approaches
Oscar Herrero Gimenez, Alejandro Pascual-Vandunciel and Francisco Resquin	Rehabilitation of Reaching Movements after Stroke using a Hybrid Robotic System triggered by motor intent	SS11. Redundancy and modularity in motor control: neuroscience, prosthetic, rehabilitative and assistive approaches
Takashi Watanabe and Takumi Tadano	An Examination of Stimulation Timing Patterns for Mobile FES Cycling under Closed-loop Control of Low Cycling Speed	SS20. Application of Functional Electrical Stimulation (FES) to lower limb movement assistance
Jenifer Miehlsbradt, Camilla Pierella, Nawal Kinany, Martina Coscia, Elvira Pirondini, Matteo Vissani, Alberto Mazzoni, Cécile Magnin, Pierre Nicolo, Adrian Guggisberg and Silvestro Micera	Evolution of cortical asymmetry with post-stroke rehabilitation: a pilot study	SS21. Uncovering neural mechanisms of post-stroke recovery using clinical imaging tools
Sigrid Dupan, Ivan Vujaklija, Giulia De Vitis, Strahinja Dosen, Dario Farina and Dick F Stegeman	HD-EMG to assess motor learning in myoelectric control	SS24. Array electrode for the assessment of muscle functions; When, where and why?
Filip Urh and Ales Holobar	Cross-examination of motor unit pulses improves the accuracy of motor unit identification from high-density EMG	SS24. Array electrode for the assessment of muscle functions; When, where and why?
Filipe O. Barroso, Alejandro Pascual-Valdunciel and José L. Pons	Review on tremor suppression using afferent electrical stimulation	SS24. Array electrode for the assessment of muscle functions; When, where and why?
Andrés Jover, Gemma Martí, Fernando Torres, Santiago Puente and Andrés Úbeda	Evaluation of hand-grip features using low-cost electromyography	SS3. Computer Models in the Design of Neurotechnologies and Rehabilitation Tools
Priscilla Corsi, Emanuele Formento, Marco Capogrosso and Silvestro Micera	Role of Renshaw cells in the mammalian locomotor circuit: a computational study	SS3. Computer Models in the Design of Neurotechnologies and Rehabilitation Tools
Elisabetta Giannessi, Maria Rita Stornelli and Pier Nicola Sergi	A hybrid framework to investigate physical stress evolution in peripheral nerves	SS3. Computer Models in the Design of Neurotechnologies and Rehabilitation Tools

Pier Nicola Sergi, Winnie Jensen, Ken Yoshida and Silvestro Micera	Hybrid and fast: a novel in silico approach with reduced computational cost to predict failures of <i>in vivo</i> needle-based implantations	SS3. Computer Models in the Design of Neurotechnologies and Rehabilitation Tools
Marco Controzzi, Francesco Clemente, Diego Barone, Lorenzo Bassi Luciani, Neri Pierotti, Michele Bacchereti and Christian Cipriani	Progress towards the development of the DeTOP hand prosthesis: a sensorized transradial prosthesis for clinical use	SS4. New perspectives in upper limb prosthetics: from the robotics laboratory to clinical use
Marion Badi, Sophie Wurth, Mélanie Kaeser, Paul Cvancara, Thomas Stieglitz, Grégoire Courtine, Jocelyne Bloch, Marco Capogrosso, Eric Rouiller and Silvestro Micera	Development of an intraneural peripheral stimulation paradigm for the restoration of fine hand control in non-human primates	SS4. New perspectives in upper limb prosthetics: from the robotics laboratory to clinical use
Jessica Brand, Ilario Imbinto, Michele Bacchereti, Christian Cipriani and Marco Controzzi	Improvements on the design of the S-Finger prosthetic digit	SS4. New perspectives in upper limb prosthetics: from the robotics laboratory to clinical use
José Flores, Javier Izquierdo and Jose Luis Pons	Design, development and evaluation of an experimental protocol, to know objectively the degree of acceptance of the users of exoskeleton for rehabilitation	SS7. Shaping robotic training to maximize patient outcome: new trends and perspectives
Irene Aprile, Marco Germanotta, Arianna Cruciani, Simona Loreti, Cristiano Pecchioli, Angelo Montesano, Silvia Galeri, Francesca Cecchi, Manuela Diverio, Catuscia Falsini, Gabriele Speranza, Emanuele Langone, Luca Padua and Fdg Robotic Rehabilitation Group	A Multicenter Randomized Controlled Trial on the upper limb robotic rehabilitation in subacute stroke using a set of robotic and sensor-based devices: feasibility of the InTeReSt study	SS7. Shaping robotic training to maximize patient outcome: new trends and perspectives
Luca Padua, Isabella Imbimbo, Irene Aprile, Claudia Loreti, Marco Germanotta, Daniele Coraci, Claudia Santilli, Arianna Cruciani, Maria Chiara Carrozza	The role of Cognitive Reserve in the choice of upper limb rehabilitation treatment after stroke. Robotic or Conventional? A multicenter study of the Don Carlo Gnocchi Foundation	SS7. Shaping robotic training to maximize patient outcome: new trends and perspectives

and Fdg Robotic Rehabilitation Group

Maria Alvarez, Delia Sepúlveda, Vicente Lozano, Silvia Ceruelo, Ángel Gil, Álvaro Gutiérrez and Ana de Los Reyes

Preliminary development of two serious games for rehabilitation of Spinal Cord injured patients

SS7. Shaping robotic training to maximize patient outcome: new trends and perspectives

Daniele Giansanti, Giovanni Maccioni and Mauro Grigioni

Integration of step counters in neuro-motion rehabilitation: from the selection of the technologies in a kit to the guidelines

SS7. Shaping robotic training to maximize patient outcome: new trends and perspectives

Juan Carlos Arceo, Jimmy Lauber, Lucien Robinault, Sebastien Paganelli, Mads Jochumsen, Imran Khan Niazi, Emilie Simoneau and Sylvain Cremoux

Modeling and Control of Rehabilitation Robotic Device: motoBOTTE

SS7. Shaping robotic training to maximize patient outcome: new trends and perspectives

Maddalena Mugnosso, Francesca Marini, Luca Doglio, Chiara Panicucci, Claudio Bruno, Paolo Moretti, Pietro Morasso and Jacopo Zenzeri

Quantitative muscle fatigue assessment in neuromuscular disorders: a pilot study on Duchenne pediatric subjects

SS7. Shaping robotic training to maximize patient outcome: new trends and perspectives  
SS8. Neurorehabilitation from clinical perspective and robotic perspective: Contradictions and Integrations

Stefano Mazzoleni, Vi Do Tran, Laura Iardella, Elisa Falchi, Paolo Dario and Federico Posteraro

Transcranial direct current stimulation and wrist robot-assisted integrated treatment on subacute stroke patients: a randomized, sham-controlled trial

SS7. Shaping robotic training to maximize patient outcome: new trends and perspectives  
SS8. Neurorehabilitation from clinical perspective and robotic perspective: Contradictions and Integrations

Marialuisa Gandolfi, Nicola Valè, Eleonora Dimitrova, Stefano Mazzoleni, Elena Battini, Maria Donata Benedetti, Alberto Gajofatto, Francesco Ferraro, Jessica Corradi, Matteo Castelli, Maruo Camin, Mirko Filippetti, Carola De Paoli, Alessandro Picelli, Elena Chemello and Nicola Smania

High-intensity robot-assisted hand training for upper limb recovery in individuals with multiple sclerosis: a randomized, controlled, single-blinded trial

SS7. Shaping robotic training to maximize patient outcome: new trends and perspectives  
SS8. Neurorehabilitation from clinical perspective and robotic perspective: Contradictions and Integrations

Usman Rashid, Nada Signal, Imran Khan Niazi and Denise Taylor	footPress: An Open-source MATLAB Toolbox for Analysis of Pedobarography Data	SS7. Shaping robotic training to maximize patient outcome: new trends and perspectives SS9. Balance control during walking-related motor tasks WeR1. Wearable sensors for robotic exoskeletons
Jorge Antonio Díez Pomares, José María Catalán Orts, Andrea Blanco Ivorra, Juan Antonio Barios Heredero, Santiago Ezquerro García, Arturo Bertomeu-Motos and Nicolas Garcia-Aracil	Grasping detection with force sensor embedded in a hand exoskeleton	
Elif Hocaoglu	WeFiTS: Wearable Fingertip Tactile Sensor	WeR1. Wearable sensors for robotic exoskeletons
Andres Hidalgo, Eveline Graf and Eduardo Rocon	An optimization approach to design control strategies for soft wearable passive exoskeletons	WeR1. Wearable sensors for robotic exoskeletons
Gabriel Aguirre Ollinger, Ashwin Narayan, Hsiao-Ju Cheng and Haoyong Yu	Exoskeleton control for post-stroke gait training of a paretic limb based on extraction of the contralateral gait phase	WeR1. Wearable sensors for robotic exoskeletons
Chris Baten, Wiebe De Vries de Vries, Leendert Schaake, Juryt Witteveen, Daniel Scherly, Konrad Stadler, Andres Hidalgo Romero, Eduardo Rocon, Danny Plass-Oude Bos and Jeroen Linssen	XoSoft Connected Monitor (XCM) unsupervised monitoring and feedback in soft exo-skeletons of 3D kinematics, kinetics, behavioral context and control system status	WeR1. Wearable sensors for robotic exoskeletons
Merve Acer and Adnan Furkan Yıldız	Force Localization Estimation Using a Designed Soft Tactile Sensor	WeR1. Wearable sensors for robotic exoskeletons WeR2. Soft Wearable Robots
John Nassour and Fred Hamker	Tactile and Proximity Servoing by A Multimodal Sensory Soft Hand	WeR1. Wearable sensors for robotic exoskeletons WeR2. Soft Wearable Robots
Evagoras Xydas and Konstantinos Kostas	Passive-active knee exoskeleton based on optimized stacked four-bar linkages for rehabilitation of stroke survivors	WeR1. Wearable sensors for robotic exoskeletons WeR3. Subject-centered based approaches for controlling Wearable

Mario Ortiz, Marisol Rodriguez-Ugarte, Eduardo Láñez and Jose M. Azorín	Study of algorithms and classifiers for an offline BMI based on motor imagery of pedaling	WeR10. Smart human-machine systems for lower-limb assistance and rehabilitation after paralysis
Luís Quinto, Sérgio Gonçalves and Miguel Silva	Design of a passive exoskeleton to support sit-to-stand movement: A 2D model for the dynamic analysis of motion	WeR10. Smart human-machine systems for lower-limb assistance and rehabilitation after paralysis
Arvind Ramanujam, Kamyar Momeni, Syed Raza Husain, Jonathan Augustine, Erica Garbarini, Peter Barrance, Ann Spungen, Pierre Asselin, Steven Knezevic and Gail Forrest	Center of mass and postural adaptations during robotic exoskeleton-assisted walking for individuals with spinal cord injury	WeR10. Smart human-machine systems for lower-limb assistance and rehabilitation after paralysis
Matteo Arquilla, Iolanda Pisotta, Federica Tamburella, Nevio Luigi Tagliamonte, Marcella Masciullo, Amy Wu, Cory Meijneke, Auke Jan Ijspeert, Herman van der Kooij and Marco Molinari	Walking Assistance of Subjects with Spinal Cord Injury with an Ankle Exoskeleton and Neuromuscular Controller	WeR10. Smart human-machine systems for lower-limb assistance and rehabilitation after paralysis WeR3. Subject-centered based approaches for controlling Wearable Robots
Andrea Calanca, Luca Bettinelli, Mauro Serpelloni and Paolo Fiorini	Introducing Series Elastic Links	WeR2. Soft Wearable Robots WeR6. Flexible and Transparent Technologies for Innovative Wearable Robotics
Claudia Haarman, Edsko Hekman, Hans Rietman and Herman van der Kooij	Pushing the Limits: A Novel Tape Spring Pushing Mechanism to be Used in a Hand Orthosis	WeR2. Soft Wearable Robots WeR6. Flexible and Transparent Technologies for Innovative Wearable Robotics
Julian Fraize, Mirjam Furth and Damiano Zanotto	Design and Preliminary Validation of a Smart Personal Flotation Device	WeR2. Soft Wearable Robots WeR6. Flexible and Transparent Technologies for Innovative Wearable Robotics
Arnaldo G. Leal-Junior, Antreas Theodosiou, Anselmo Frizera, Maria F. Domingues, Cátia Leitão, Kyriacos Kalli, Paulo André, Paulo Antunes, Maria José Pontes and Carlos Marques	Polymer Optical Fiber Sensors Approaches for Insole Instrumentation	WeR6. Flexible and Transparent Technologies for Innovative Wearable Robotics
Stein Crispel, Pablo Lopez Garcia, Tom Verstraten, Bryan	Introducing compound planetary gears (C-PGTs): a compact way to achieve high gear ratios for wearable robots	WeR6. Flexible and Transparent Technologies for Innovative Wearable Robotics

Convens, Elias Saerens, Bram  
Vanderborght and Dirk Lefeber

Matteo Bianchi, Nicola Secciani,  
Alessandro Ridolfi, Federica  
Vannetti and Guido Pasquini

Model-based approach in developing a  
hand exoskeleton for children: a  
preliminary study

WeR6. Flexible and Transparent Technologies for Innovative Wearable Robotics