

23 September 2021

24 September 2021

25 September 2021

10:00 - 11:30 CET

SESSION 2A

FES, Critical Care and COVID 19

Moderators: Jonathan Jarvis, UK & Tamsyn Street, UK

Non-invasive phrenic nerve stimulation to avoid ventilator induced diaphragm deconditioning in critical care: parameter optimisation, **Conor Keogh, UK**

Non-invasive phrenic nerve stimulation to avoid ventilator induced diaphragm deconditioning in critical care: system design and feasibility, **Francisco Saavedra, Chile**

Reduction in mechanical ventilation time using diaphragm pacing to decrease the burden on ICU resources during COVID Pandemic, **Tony Ignagni, USA**

Lungpacer diaphragm pacing therapy: empowering independent breathing, **Doug Evans, USA**

12:45 - 14:15 CET

SESSION 6A

H2020 Rehyb Project minisymposium

Moderator: Thierry Keller, Spain

ReHyb Introduction, **Satoshi Endo, Germany**

End-user / clinical requirements analysis, **Carmen Krewer, Germany**

Control concept and challenges for FES, **Hossein Kaviani, Germany & Thierry Keller, Spain**

General concept and approaches in neurorehabilitation, **Paul Verschure, Spain & Anna Mura, Spain**

Hybrid FES and Robot Feedback to Accelerate Motor Learning, **Aaron Yurkewich, UK & Martin Einkenkel, UK & Lucille Cazenave, UK**

Schön Klinik video demo, **Carmen Krewer, Germany**

Imperial College London live/video demo, **Aaron Yurkewich, UK & Hossein Kaviani, Germany**

Technical University Munich live demo, **Satoshi Endo, Germany & Miruna Werkmeister, Germany**

18:00 - 19:00 CET

SESSION 1B/2B
JOINT SESSION

Hybrid systems based on robotics and FES, Transdisciplinary training for a full deployment of technologies in rehabilitation

Moderator: Jules Dewald, USA & Mike Ellis, USA

Smart use of mechatronics and brain imaging approaches to study movement impairments post unilateral brain injury, **Jules Dewald, USA**

Science based Robotic interventions post hemiparetic stroke, **Mike Ellis, USA**

Smart use of FES for the paretic hand in chronic hemiparetic stroke, **Jun Yao, USA**

Development of a new home-based measure of hypertonia and kinematics using AI, **Hongchul Sohn, USA**

19:00 - 19:30 CET

Transdisciplinary training for a full deployment of technologies in rehabilitation

Moderator: Emilia Ambrosini, Italy

Why rehabilitation medicine requires transdisciplinary competences, **Franco Molteni, Italy**

Transdisciplinary education in rehab technologies, **Alessandra Pedrocchi, Italy**

20:45 - 22:15 CET

SESSION 6B

Live Event from the Clinic @ Toronto

Moderators: Ines Bersch, Switzerland & Cesar Marquez-Chin, Canada

Transcutaneous Functional Electrical Stimulation: Demonstration of clinical applications for restoring upper extremity function, **Naaz Desai, Canada**

10:00 - 11:30 CET

SESSION 10A

History of IFESS: It all started in 1963 in Opatija

Moderators: Thierry Keller, Spain, Simona Ferrente, Italy & Marinko Rade, Croatia

*Dejan Popovic, Serbia
Winfried Mayr, Austria*

12:45 - 14:15 CET

SESSION 14A/15A
JOINT SESSION

Live Event from the Clinic @ Nottwil Paraplegic Centre: Effectiveness of technologies in clinical practice- from an idea to implementation

Moderator: Ines Bersch, Switzerland

18:00 - 19:00 CET

SESSION 10B

Role of electrodes and stimulation parameters in the recruitment of nerves and muscle fibers; Artificial Organs: the IFESS official journal

Moderators: Jonathan Jarvis & Tamsyn Street, UK

Role of electrodes and stimulation parameters in the recruitment of nerves and muscle fibers, **Winfried Mayr, Austria**

Sub-threshold pre-pulses to modify the excitability of nerve fibers during

transcutaneous electrical stimulation, **Jose Luis Vargas Luna, Austria**

Electrical neuromodulation during robot-assisted stepping in humans with spinal cord injury, **Matthias Krenn, USA**

19:00 - 19:30 CET

Artificial Organs: the IFESS official journal

Moderators: Jonathan Jarvis & Tamsyn Street, UK

Vakhtang Tchantchaleishvili, USA

20:45 - 22:15 CET

SESSION 14B

IFESS contributions Fast Forward Session and Live Discussion

Moderators: Jonathan Jarvis, UK, Winfried Mayr, Austria, Cesar Marquez-Chin, Canada, Simona Ferrante, Italy

Feasibility of Bimanual BCI-FES system in Stroke, **Radha Kumari**

The SOCC: Smart Ongoing Circulatory Compressions A wearable Device for the Prevention of Deep Vein Thrombosis, **Michel Gauthier**

Evaluation of Cumulative Charge Activation Technology in Decreasing Delayed-onset Muscle Soreness after Eccentric Exercise, **Ivan Nail-Ulloa**

Stretchable Cable for Mechanically Stable Intraspinal Microstimulation Implants, **Sorosh Mirkiani**

Influence of Vibration Stimuli Applied on the Quadriceps Femoris Muscle during Functional Electrical Stimulation Induced Cycling, **Evan Tulsy**

Robot-Assisted Training With Functional Electrical Stimulation Enhances Lower Extremity Function After Spinal Cord Injury, **Ines Bersch**

Effects On Power Output And Muscle Oxygenation Of Two Electrical Stimulation-Induced Cycling Modalities, **Marie Alberty**

Mapping the Motor Networks in the Spinal Cord: Investigating the Safety for Future Research in Humans, **Carly O'Sullivan**

Electromyography-Based Cadence Control Of Functional Electrical Stimulation Cycle, **Akbari Saiedeh**

A Mobile Fes-Cycling System With Pedal Force Measurement To Optimize Training Performance, **Federica Ferrari**

Spatially Distributed Sequential Stimulation Improves Fatigue Resistance in Functional Electrical Stimulation Rowing, **Gongkai Ye**

C-Cuff electrodes: an updated durable 3D SLA printed cuff electrode, **Onna Marie Doering**

Novel High Performance Carbon + PEDOT:PSS Based Bioelectric Interface, **Christian Vetter**

Strain Analysis in Spinal Cord Surrogate to Investigate the Mechanical Stability of a Novel Wireless Intraspinal Microstimulation Interface, **Omar Tawakol**

The effect of FES on gait kinematics and walking speed in people with MS under dual-tasking and fatiguing walking conditions, **Georgia Andreopoulos**

10:00 - 11:30 CET

SESSION 18A

IFESS contributions Fast Forward Session and Live Discussion

Moderators: Matija Milosevic, Canada, Simona Ferrante, Italy, Thierry Keller, UK

Evoked Sensations With Sinusoidal Transcutaneous Electrical Stimulation at Different Frequencies, **Eukene Imatz-Ojanguren**

IMU triggered FES for Robotic Gait Training, **Andreas Schicketmueller**

Trans-spinal electrical stimulation for improving trunk and sitting function in tetraplegics with cervical cord injury, **Niraj Singh Tharu**

A Combined Approach To CNS Excitation For Hand Rehabilitation: A Case Study Using Spinal Stimulation And BCI, **Ciaran McGeady**

Analysis Of The Movements Generated By a Multi-Field FES Device For Upper Extremity Rehabilitation, **Aitor Martin-Odrizola**

Neuromuscular And Functional Electrical Stimulation For Motor Recovery After COVID-19: Systematic Review, **Aitor Martin-Odrizola**

Development of Integrated Multi-Point Electrodes for FES Using Power Net to Induce Hand Posture, **In Morimoto**

Skeletal Muscle Weakness in Post-Covid Pandemic Syndrome: Role For Full-Body in-bed Gym and FES, **Ugo Carraro**

Design Of Multi-Pad Electrodes For Multimodal Electrotactile Feedback From Supernumerary Limbs, **Tanja Boljanic**

Force-Controlled Functional Electrical Stimulation For Grip Assistance And Rehabilitation, **Juliette Ngan**

Longer duration cortical and peripheral stimulation may enhance corticospinal facilitation, **Na Cao**

Agonist-Antagonist Muscle Co-contraction Torque in Hybrid-Dynamic Movement, **Nur Azah Hamzaid**

Development of an Anatomically Realistic Cervical Transcutaneous Spinal Cord Stimulation Model, **Roberto Martins de Freitas**

Pilot Study On The Combination Of Robotic Gait Training With Stimulation Of Withdrawal Reflex in Patients With Spinal Cord Injury, **Erika G. Spaich**

Effects Of Stimulating Trunk and Hip Muscles on Reach and Arm Strength After Spinal Cord Injury, **Monique van der Vorst**

Capabilities of Full-Body Wearable Teslasuit as a Self-Standing FES Device – Exploratory Study, **Uladzislau Mitskevich**

Effects Of Neuromuscular Electrical Stimulation on Blood Pressure in Individuals with Spinal Cord Injury, **Katja Podvinšek**

12:00 - 12:45 CET

Vodovnik Student Award Ceremony

Moderators: Erika G. Spaich, Cesar Marquez, Winfried Mayr, Simona Ferrante

Matija Milosevic

12:45 - 14:15 CET

SESSION 22A

Neuroscience, rehabilitation and human-machine interfaces

Moderator: Thierry Keller, UK

SPECS-lab, IBEC, ICREA: Translating brain theory to neurorehabilitation: Introduction, **Paul Verschure, Spain**

Insel Spital Bern: Linking BCI to FES in post-stroke upper limb recovery, **Adrian Guggisberg, Italy**

Eodyne Systems / SPECS-lab, Barcelona: Whole brain models of Diaschisis as a new tool for diagnostics and prognostics, **Francisco Santos**

Predicting recovery from goal-oriented movement, **Ton Coolen, Netherlands & Fabrizio Antenucci, Italy**

SPECS-lab, IBEC, ICREA: Translating brain theory to neurorehabilitation: The Rehabilitation Gaming System use case, **Paul Verschure, Spain**

Heinrich Heine University: Diaschisis and post-stroke recovery, **Anna Mura, Germany**

Nobel institute for neurophysiology Karolinska institute, Neural principles of motor control and their translation to the clinic, **Sten Grillner, Sweden**

18:00 - 19:30 CET

SESSION 18B

Development of clinical guidelines for FES in mobility

Moderator: Tamsyn Street, UK

Development of Clinical Guidelines for Functional Electrical Stimulation in mobility, **Jane Burridge, UK & Cathy Bulley, UK**

A Clinical Practice Guideline for the Use of Ankle-Foot Orthoses and Functional Electrical Stimulation Post-Stroke, **Therese E. Johnston, USA & Lisa Brown, USA**

Interactive discussion of guideline implementation and education, **Cathy Bulley, UK**

Round table discussion: Key challenges in guideline development and implementation, **Tamsyn Street, UK**

20:45 - 22:15 CET

SESSION 22B

IFESS Webinar series: Functionally relevant brain stimulation; The feasibility and efficacy of FES for the upper limb in young children with unilateral cerebral palsy; Restoration of bladder and bowel function following spinal cord injury.

Moderators: Tamsyn Street, UK & Ken Yoshida, USA

Restoration of bladder and bowel function following spinal cord injury, **Sean Doherty, UK**

Functionally relevant brain stimulation, **Luka Milosevic, Canada**

The feasibility and efficacy of FES for the upper limb in young children with unilateral cerebral palsy, **Kristin Musselman, Canada**