XVII National Congress of the Italian Society of Movement Analysis in Clinics - SIAMOC

Milano 5 - 8 October 2016

Centro Congressi Fondazione Cariplo
Dear friends and colleagues, we are really delighted to announce the XVII Congress of SIAMOC that will be held in Milano from 5 to 8 October 2016 and will be organised by Don Carlo Gnocchi Foundation, at Centro Congressi Cariplo. It is an honor for us to chair this now traditional event in the scientific and clinical national context which attracts experts and professionals of human movement analysis, with the aim of foster the professional updating, the deepening of hot topics, and the presentation of recent results from methodological studies and clinical applications of this exciting field. This is also the right opportunity to share information and to start new collaborations among experts in the field, a fundamental aspect in an interdisciplinary and multiprofessional society like SIAMOC.

The conference will cover different topics related to human movement science: from the basic aspects of motor intention and awareness, to cortical and subcortical organisation of motor control; from the clinical application of instrumented movement analysis in orthopedics, neurology and rehabilitation, to the recent technological developments of wearable sensors, advanced rehabilitation systems and innovative 3D techniques for designing and manufacturing orthotics and prosthetics devices.

Keynote lectures on some of the above themes, held by national and international experts, will introduce and stimulate oral and poster sessions open to participants’ contributions. Three precongress introductory courses will be held on (1) Gait Analysis and clinical decision making of patients affected by spasticity, (2) movement analysis with magneto-inertial wearable sensors and (3) the quantitative measurement of outcome in rehabilitation. All courses will have an applied focus and will be taught by teachers with strong clinical and/or technical expertise on relevant topics.

In addition to traditional SIAMOC awards to the best methodological and clinical papers and to the stage award for young researchers, this year the organising institution will offer also a prize to the best rehabilitative paper in memory of professor Silvano Boccardi, one of the founders of rehabilitation medicine in Italy - as well as cofounder and honorary president of SIAMOC - who pioneered the clinical application of instrumented movement analysis exactly at the Don Gnocchi Foundation in Milano.

The vibrant city of Milano will offer to conference participants its historical, cultural, gastronomic and architectural attractions, recently renewed. The location of the Congress Center - just a few minutes walk from Duomo, Teatro alla Scala and Castello Sforzesco - will make these pleasant activities easier.

But since the true soul of a conference are attendees, with their oral or poster presentations, questions and participation to the discussions, we strongly invite you to actively join the XVII SIAMOC Congress.

Welcome to Milano!

Maurizio Ferrarin  
Chairman of XVII Congress of SIAMOC  
Laboratory of Movement Bioengineering  
IRCCS Don Carlo Gnocchi Foundation, Milano

Stefano Cavazza  
SIAMOC President  
Opetive Unit Rehabilitation Medicine  
Nuovo Ospedale Civile S. Agostino Estense, Modena
COMMITTEES

Congress Chairman

Maurizio Ferrarin, IRCCS Fondazione Don Carlo Gnocchi, Milano

Scientific committee

Pietro Cialiandro, Fondazione Policlinico Universitario Agostino Gemelli, Roma
Stefano Cavazza, Nuovo Ospedale Civile S. Agostino Estense, Modena
Andrea Cereatti, Università degli Studi di Sassari
Lorenzo Chiari, Università di Bologna
Alessandra Colazza, IRCCS Ospedale Pediatrico Bambino Gesù, Roma
Andrea Giovanni Cutti, Centro Protesi INAIL, Budrio (BO)
Ugo Della Croce, Università degli Studi di Sassari
Alberto Leardini, Istituto Ortopedico Rizzoli, Bologna
Davide Mazzoli, Sol et Salus, Rimini
Antonio Nardone, IRCCS Fond. Salvatore Maugeri, Veruno (NO) e Univ. degli Studi del Piemonte Orientale
Stefano Negrini, Università di Brescia e IRCCS Fondazione Don Carlo Gnocchi, Milano
Maurizio Petrarca, IRCCS Ospedale Pediatrico Bambino Gesù, Roma
Marco Rabuffetti, IRCCS Fondazione Don Carlo Gnocchi, Milano
Rita Stagni, Università di Bologna

Local Organising Committee

Gianluca Bonora, Gabriele Bovi, Ilaria Carpinella, Tiziana Lencioni
Jessica Matera (Organising secretariat)
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Congress website: http://siamoc2016.dongnocchi.it

AIMS OF THE CONGRESS

To foster the development and clinical applications of instrumented movement analysis for: the study of pathophysiology of movement disorders, the prevention and functional diagnosis of diseases affecting the locomotor system, facilitating clinical decision making process and evaluating the efficacy of therapeutic and rehabilitation treatments.

TARGET GROUPS

The SIAMOC congress is targeted to all professionals who are involved in human movement analysis for research, both biomedical and bioengineering, and clinical applications also during university education:

- physical medicine and rehabilitation physicians, physiatrist, neurologists, orthopaedic surgeons, paediatricians, geriatricians, sport medicine physician
- biomechanical, biomedical, rehabilitation, robotics, clinical engineers
- physiotherapists, occupational therapists, prosthethists and orthotists, neurophysiopathology technicians
- human movement scientists
- psychologists, neuropsychologists
SPEAKERS AND MODERATORS

Denise Anastasi, IRCCS S. Maria Nascente, Fondazione Don Carlo Gnocchi Onlus, Milano

Anna Berti, Dipartimento di Psicologia, Università di Torino, Torino

Rita Bertoni, IRCCS S. Maria Nascente, Fondazione Don Carlo Gnocchi Onlus, Milano

Emilio Bizzi, Massachusetts Institute of Technology, Boston, USA

Thomas Bowman, IRCCS S. Maria Nascente, Fondazione Don Carlo Gnocchi Onlus, Milano

Pietro Caliandro, Dipartimento di Geriatria, Neuroscienze e Ortopedia, Fondazione Policlinico Universitario Agostino Gemelli, Roma

Isabella Campanini, Laboratorio di Analisi del Movimento, Dipartimento di Riabilitazione, Ospedale di Correggio, Reggio Emilia

Ilaria Carpinella, Polo Tecnologico, IRCCS S. Maria Nascente, Fondazione Don Carlo Gnocchi Onlus, Milano

Elena Carraro, IRCCS Eugenio Medea, Associazione La Nostra Famiglia, Conegliano e Pieve di Soligo, TV

Anna Castagna, IRCCS S. Maria Nascente, Fondazione Don Carlo Gnocchi Onlus, Milano

Davide Cattaneo, IRCCS S. Maria Nascente, Fondazione Don Carlo Gnocchi Onlus, Milano

Marco Cavallaro, Brunel University, Londra

Stefano Cavazza, Unità Operativa Medicina Riabilitativa, Dipartimento di Medicina Interna e Riabilitazione, Nuovo Ospedale Civile S. Agostino Estense, Modena

Andrea Cereatti, Dipartimento di Scienze Politiche, Scienze della Comunicazione, e Ingegneria dell'Informazione, Università di Sassari, Sassari

Lorenzo Chiari, Dipartimento di Ingegneria dell'Energia Elettrica e dell'Informazione & Centro Interdipartimentale in Scienze della Vita e Tecnologie per la Salute, Università di Bologna, Bologna

Matteo Cioni, Dipartimento di Scienze Biomediche e Biotecnologiche, Università di Catania, Catania

Davide Conte, IRCCS Eugenio Medea, Assoc. La Nostra Famiglia, Conegliano e Pieve di Soligo, TV

Michela Cosma, Laboratorio Analisi del Movimento, U.O. Medicina Riabilitativa, Azienda Ospedaliero-Universitaria di Ferrara, Ferrara

Alessandro Crippa, IRCCS S. Maria Nascente, Fondazione Don Carlo Gnocchi Onlus, Milano

Andrea Giovanni Cutti, Laboratorio di Analisi del Movimento, Centro protesi INAIL, Budrio

Ugo Della Croce, Dipartimento di Scienze Politiche, Scienze della Comunicazione, e Ingegneria dell'Informazione, Università di Sassari, Sassari

Silvia Fantozzi, Dipartimento di Ingegneria dell'Energia Elettrica e dell'Informazione, Università di Bologna, Bologna

Adriano Ferrari, Unità di Riabilitazione delle Gravi Disabilità Infantili dell'Età Evolutiva, Arcispedale S. Maria Nuova e Università di Modena e Reggio Emilia, Reggio Emilia

Maurizio Ferrari, Polo Tecnologico, IRCCS S. Maria Nascente, Fondazione Don Carlo Gnocchi Onlus, Milano

Carlo Frigo, Dipartimento di Elettronica, Informazione e Bioingegneria, Politecnico di Milano, Milano
VRECONGRESS PROGRAM

WEDNESDAY 5 OCTOBER 2016

Venue: Fondazione Don Carlo Gnocchi Onlus, Centro IRCCS S. Maria Nascente
Via Capecelatro, 66 Milano

08:00 Participant registration to precongress courses

09:00-13:30 Precongress Course 1: **Gait Analysis in patients with spasticity: clinical decision making, treatment and outcome assessment**

**Speakers:** E. Carraro (Conegliano), A. Castagna (Milano), M. Cioni (Catania), D. Conte (Conegliano), A. Crippa (Milano), J. Jonsdottir (Milano), M. Osio (Milano)

09:00-13:30 Precongress Course 2: **Clinical movement analysis by means of inertial and magnetic sensors**

**Speakers:** A. Cereatti (Sassari), I. Carpinella (Milano), A. Mannini (Pisa), M. Rabuffetti (Milano), R. Stagni (Bologna)

09:00-13:30 Precongress Course 3 (in collaboration with GIS-Neuroscience AIFI): **Movement analysis and rehabilitation: quantitative measurement of outcome**

**Speakers:** D. Anastasi (Milano), R. Bertoni (Milano), T. Bowman (Milano), I. Campanini (Reggio Emilia), D. Cattaneo (Milano), E. Gervasoni (Milano), S. Mezzarobba (Trieste), M. Pau (Cagliari), M. Petrarca (Roma)
WEDNESDAY 5 OCTOBER 2016

Venue: Centro Congressi Fondazione Cariplo, Via Romagnosi, 8 Milano

15:00  Participant registration

17:00  Opening ceremony and welcome address

17:15  Congress presentation
Stefano Cavazza, Maurizio Ferrarin

17:30  Opening lecture: "Modular organization of the motor system: muscle synergies and their relevance to rehabilitation"
Emilio Bizzi, Massachusetts Institute of Technology, Boston, USA
Introduction: Paolo Mocarelli

18:15  Movement, music and rehabilitation: "The gesture that sounds and resounds"
Licia Sbattella, Biomedical Engineer and Psychotherapist, Polytechnic of Milano, Scientific Director and President of Fondazione Sequeri Esagramma, Milano
With the participation of String Orchestra of Center for Esagramma Method "La Nota in Più", Bergamo. Director and violin soloist: Marco Lorenzi

19:00  Delivery honorary plaques,
Stefano Cavazza

Welcome cocktail
<table>
<thead>
<tr>
<th>Time</th>
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| 09:00  | Keynote lecture: "Motor intention and movement awareness in normal subjects and in brain damaged patients"  
Anna Berti, Department of Psychology, University of Torino  
Introduction: Marco Rabuffetti |
| 09:45  | **Session 1 - Sensory-motor control**                                |
| 09:45-09:57 | O1  Single task and dual task gait: in which condition do we walk more automatically? Answer changes with maturation - M.C. Bisi, P. Tamburini, R. Stagni |
| 09:58-10:10 | O2  The role of peripheral visual information when climbing a staircase with step height variations - V. Graci, M. Rabuffetti, C.A. Frigo, M. Ferrarin |
| 10:11-10:23 | O3  Longitudinal study of gait lower limb coordination and rehabilitative indications in patients affected by Ataxia of Friedreich (FRDA) - M. Petrarca, G. Vasco, S. Gazzellini, S. Carniel, A. Pisano, E. Bertini, E. Castelli |
| 10:24-10:36 | O4  Anticipatory synergy adjustments and anticipatory postural adjustments: Effects of predictability of perturbation direction - D. Piscitelli, A. Falaki, C.G. Cerri, M.L. Latash |
| 11:03-11:15 | O7  Subtle abnormalities in gait of patients with Parkinson’s disease walking linearly at the same speed of healthy subjects show up during curved walking - A.M. Turcato, M. Godi, M. Giardini, M. Schieppati, A. Nardone |
| 11:15  | Coffee break                                                        |
| 11:45  | **Session 2 - Biomechanical models and quantitative indexes**        |
| 11:45-11:57 | O8  Definition of a subject-specific model of the knee in vivo - F. Nardini, N. Sancisi, C. Belvedere, M. Conconi, A. Leardini, V. Parenti Castelli |
| 12:11-12:23 | O10 Choosing a Similarity Index to quantify gait data variability - R. Di Marco, A. Pacilli, E. Scalona, S. Rossi, C. Mazzà, P. Cappa |
Variability and stability indexes in Dual-Task condition: methodological and physiological aspects - P. Tamburini, R. Stagni


13:15 Lunch

14:15 Keynote lecture: "Efficacy of Gait Analysis in Clinical Decision Making and Outcomes" Tishya Wren, Children's Orthopedic Center, Children's Hospital Los Angeles, USA

Introduction: Carlo Frigo

15:00 Session 3 - Clinical Poster (see list in the following pages)

Moderators: Michela Cosma, Taian Vieira

16:30 Coffe break

17:00 Session 4 - Movement analysis in neurology

Moderators: Matteo Cioni, Zimi Sawacha


17:12-17:24 O16 Evolution of gait alterations in Charcot-Marie-Tooth disease: 3 longitudinal case-studies - D. Conte, E. Carraro, E. Trevisi, M. Santin, D. Berto, A. Martinuzzi


18:15 User group meeting BTS

18:45 SIAMOC-SINC study group "Movement Neurophysiology"
09:00  **Session 5 - Movement analysis with wearable sensors**

Moderators: Andrea Cereatti, Antonio Nardone

09:00-09:12 O21  *In vivo identification of the shoulder joint centre of rotation using a magneto-inertial sensor* - M. Crabolu, D. Pani, L. Raffo, M. Conti, P. Crivelli, A. Cereatti

09:13-09:25 O22  *A proximity sensor for the measurement of the inter-foot distance in static and dynamic tasks* - S. Bertuelli, A. Cereatti, M. Caldara, U. Della Croce

09:26-09:38 O23  *Continuous monitoring of natural turns during activities of daily living: to better elucidate the relationship between turning ability and fall history/risk in community-dwelling older adults* - J.M. Leach, S. Mellone, P. Palumbo, A. Coni, S. Bandinelli, L. Chiari


10:05-10:17 O26  *Use of sensor-based gait quality indices to assess physical rehabilitation programs in Parkinson disease* - E. Bergamini, M.E. Tondinelli, M. Tiburzi, G. Vannozzi

10:18-10:30 O27  *ACL injury risk during Rugby tackle can be evaluate through an on-field task-specific analysis: a pilot study* - D. Pavan, F. Cibin, A. Guiotto, A. Rizzi, E. Roma, A. Colangelo, T. Casagrande, A. Sgorlon, G. Sbrocco, Z. Sawacha

10:30  **Coffe break**

11:00  **Session 6 - Orthotics and prosthetics**

Moderators: Isabella Campanini, Andrea Giovanni Cutti

11:00-11:12 O28  *Impingement and range of motion in total hip replacement: a three-dimensional gait and video-fluoroscopic analysis* - C. Belvedere, M. Cadossi, S. Tamarri, G. Lullini, A. Ensini, A. Cencioni, A. Leardini


11:24-11:36 O30  *Restoring walking after total knee arthroplasty: symmetries of 3D body centre of mass trajectory and mechanical work* - E. Seminati, L. Pulici, D. Cazzola, P. Cabitza, P. Randelli, A.E. Minetti


11:50-12:02 O32  *Assessment of coupled movements in head movements performed by patients with Motor Neurone Disease* - S. Pancani, W. Tindale, P.J. Shaw, C.J. McDermott, C. Mazzà

12:03-12:15 O33  *Plantar pressure analysis of custom-made insoles for safety shoes* - P. Caravaggi, A. Giangrande, G. Lullini, L. Berti, G. Padula, A. Leardini
12:15  Keynote lecture: "Clinical neurophysiology and movement analysis: towards the integration of two complementary instrumental approaches"

**Paolo Maria Rossini**, Neurology Institute, Catholic University of The Sacred Heart, Fondazione Policlinico Universitario A. Gemelli, Roma

Introduction: Pietro Caliandro

13:00  Lunch

14:00  Round table: "Advanced methods for the design and construction of limb prostheses and orthoses with 3D printing. The point of view of the clinician, biomedical engineer, industrial designer, orthotic technician"

Introduction and moderation: Alberto Leardini, Istituto Ortopedico Rizzoli, Bologna

Participants: Adriano Ferrari, Università di Modena e Reggio Emilia; Andrea Cutti, Centro protesi INAIL, Budrio; Marco Cavallaro, Brunel University, Londra; Stefano Nerozzi, Ortopedia Podologia Malpighi, Bologna

15:00  **Session 7 - Methodological Posters** (see list in the following pages)

Moderatori: Davide Mazzoli, Silvia Fantozzi

16:30  Coffe break

17:00  **Session 8 - Innovative technologies for rehabilitation**

Moderators: Lorenzo Chiari, Stefano Negrini

17:00-17:12 O34  Planar robotic rehabilitation of upper limb in post-stroke subjects: transfer of training effects to a non-trained 3D functional task - I. Carpinella, J. Jonsdottir, T. Lencioni, T. Bowman, M. Ferrarin

17:12-17:24 O35  sEMG shows differences in motor unit recruitment pattern induced by either high frequency vibration or NMES - R. Casale, G. Boccia, M.G. Benedetti, G.P. Buttacchio, A. Rainoldi

17:24-17:36 O36  Physical and cognitive effort during robotic exoskeleton assisted walking on treadmill and overground in SCI persons - S. Mazzoleni, E. Battini, M. Dini, S. Corbianco, A. Gerini, G. Stampacchia


18:15  **SIAMOC member general assembly**

20:30  Social dinner
09:00 Keynote lecture: "Wearable systems for motor rehabilitation"

**Lorenzo Chiari**, Department of Electrical, Electronic, and Information Engineering & CIRI Health, University of Bologna

Introduction: Antonio Nardone

09:45 Session 9 - Neurophysiology and movement

Moderators: Pietro Caliandro, Giuseppe Vannozzi


09:58-10:10 O41 *Gait training with Ekso in ischemic chronic stroke patients: effects on the timing of muscle activation and metabolic activation of the prefrontal cortex* - C. Simbolotti, F. Molteni, E. Guanziroli, C. Iacovelli, L. Padua, S. Cicetti, M. Caloi, P. Caliandro


10:23-10:35 O43 *Large inter-electrode distances lead to more representative bipolar EMGs, not necessarily affected by crosstalk* - T. Vieira, S. Muceli, D. Farina, A. Botter

10:36-10:48 O44 Actigraphic monitoring of the upper limbs movements in acute stroke patients - C. Iacovelli, P. Caliandro, M. Rabuffetti, C. Simbolotti, L. Padua, G. Reale, P.M. Rossini

10:48-11:00 O45 *Association between gait, cognition and grey matter volume in MCI and Healthy controls* - E. Cosentino, M. Mitolo, C. Della Pieta’, F. Meneghello, V. Iaia, G. Levedianos, A. Venneri

11:00 Coffee break

11:30 Keynote lecture: "Clinical Movement Analysis in Italy: the road traveled and future perspectives"

**Carlo Frigo**, Department of Electronics, Information and Bioengineering, Polytechnic of Milano

Introduction: Ugo Della Croce

12:15 SIAMOC awards announcement and closing session

Stefano Cavazza, Maurizio Ferrarin

13:00 ECM questionnaire
PC01 Dynamic Electromyography guided-treatment of mixed forms camptocormia and Pisa Syndrome in Parkinson’s disease with botulinum toxin and rehabilitation - M. Bacchini, G. Chiari, M. Rossi

PC02 Instrumented version of the modified Dynamic Gait Index: pilot study on different neurological populations - G. Bovi, F. Gervasoni, D. Anastasi, M. Ferrarin, D. Cattaneo

PC03 Walking variability, oxygen uptake and physical activity in older women - D. Ciprandi, M. Zago, M. Piacenza, C. Galvani, C. Sforza

PC04 The lateral shift of center of pressure is negatively correlated with motor performance of upper or lower limbs in poststroke hemiplegic patients - S. Lee, I. Lee, I. Song, B. Jung, C.H. Kim, H.J. Hong, S.Y. Choi, Y.Y. Choi, M. Kim, K.K. Sung


PC06 Influence of the amount of body weight support on lower limb joints’ kinematics during treadmill walking at different gait speeds: defining trajectories for robot assistance - S. Sirolli, M. Ferrarin, M. Rabuffetti, F. Garbarini, A. Marzegan, E. Geda, K. Sacco

PC07 The lesson from gait analysis on obese adolescent pre and after Sleeve Gastrectomy - E. Castelli, O.D. Adoriso, M. Petrarcha, R. Carbonetti, M. Favetta, A. Pisano, S. Carniel, F. De Peppo

PC08 Sit-to-Walk evaluation by means of inertial measurement units in subjects with Progressive supranuclear palsy and Parkinson’s disease - C. Palmisano, A. Leporini, G. Pezzoli, I.U. Isaia, C.A. Frigo

PC09 Experimental assessment of the effects of manual pressure or taping on myotendinous junction on maximal voluntary contractions in healthy people - S. Niti, M. Cortesi, A. Marzegan, M. Rabuffetti

PC10 Evaluation of both muscle energy expenditure and muscle forces for support and progression in individuals with crouch gait - E.P. Ravera, M.J. Crespo, P.A. Catalfamo Formento


PC12 Preliminary Results on the Relation between Foot Posture and Development of Low Back Pain (LBP) in Young Football Players by using Flex-Relaxation Ratio and Arch Index clinical tests - I. Bortone, R. Furone, R. Savio, L. Moretti, B. Moretti

PC13 Effects of Shoes and a Prefabricated Medial Arch Support on Medial Gastrocnemius and Tibialis Anterior Activity while doing Leg Press Exercise in Normal Feet Subjects - M. Sheikhi, S. Piroozi, M. Mirzaei Khoshalani, T. Motiallah


PC15 A new inertial sensor based system for rehabilitation after orthopaedic treatments: integration of biofeedbacks and muscular activation - G. Lullini, S. Tamarri, P. Caravaggi, L. Di Gianni, L. Berti, A. Leardini

PC16 Upper limb functional evaluation comparing clinical rating scales and instrumental measures: a pilot study in children with spastic hemiplegia in Cerebral Palsy - G. Bongiorno, D. Conte, M.G. Lunardelli, A. Martinuzzi, E. Carraro

PC17 Hemiparetic gait: how and how much gait speed influences spatio-temporal parameters - M. Vallasciani, A. Ruggiero, F. Tombolini
PC18  **Effects of Biodanza® SRT on motor, cognitive and behavioural parameters of patients with Parkinson's disease: a three-dimensional motion analysis (3D-MA) study** - R. Rosa, V. Agosti, G. Santangelo, P. Varriale, M. Siciliano, R. Rucco, A. Polverino, F. Jacini, C. Vitale, G. Sorrentino

PC19  **Body representation disturbances in obesity: a quantitative study** - N. Cau, V. Cimolin, F. Scarpina, L. Pacifici, A. Mauro, M. Galli, G. Castelnuovo, L. Pianta, S. Corti, P. Capodaglio

PC20  **Instrumental analysis of selected items of Melbourne assessment in children with cerebral palsy: a pilot study** - T. Lencioni, A. Castagna, M. Mandalà, M. Mazzola, C. Fedeli, M. Rodocanachi, A. Marzegan


PC22  **A First Observational Study in the CARE Lab: Toward a Novel Approach in Pediatric Rehabilitation** - L. Olivieri, P. Meriggi, A. Castagna, C. Fedeli, M. Mazzola, M. Mandalà, E. Brazzoli, M. Rodocanachi

PC23  **Kinematic analysis of patients with reverse shoulder arthroplasty** - O. d'Esposito, A. Ammendolia, O. Galasso, G. Fragomeni, A. Indino, G. de Scorpio, L. Tarducci, G. Gasparini, M. Iocco


PC25  **Association between the Outcomes of a Smartphone-based Activity Monitoring and Traditional Clinical Assessment Tools in the General Population** - S. Mellone, M. Colpo, S. Bandinelli, L. Chiari


PC28  **Role of movement analysis in a tailored integrated rehabilitation protocol based on motor learning techniques in patients affected by cervical dystonia** - C. Corrini, A. Crippa, G. Giacobbi, L. Sciumè, D. Anastasi, M. Ramella, A. Montesano, A. Castagna

PC29  **Role of pelvis attitude on the lower limb coordination: In vivo simulation could improve the interpretation of pathological conditions** - A. Colazza, M. Petrarca, S. Carniel, A. Pisano, R. Carbonetti, M. Favetta, S. Gazzellini, E. Castelli

PC30  **Effect of rapid palatal expansion on patients with temporo-mandibular joint disorders** - A. Guiotto, O. Surace, F. Spolaor, M. Mason, A. Gracco, Z. Sawacha

PC31  **The influence of the backpack load in the biomechanical gait parameter: preliminary results** - A. Silvatti, A. Lopes, G. Bernardina, P. Cerveri

PC32  **The role of motor intention in shaping the body metric representation: Tool-use training with and without robotic assistance** - F. Garbarini, I. Carpinella, M. Rabuffetti, V. Bruno, L. De Giuli, M. Ferrarin
METHODOLOGICAL POSTER SESSION
Friday 7 October 2016, h. 15:00-16:30
Moderators: Davide Mazzoli, Silvia Fantozzi

PM01 Accelerometric-based Features as Surrogate of Tinetti test - M.W. Rivolta, M. Aktaruzzaman, G. Rizzo, C.L. Lafortuna, M. Ferrarin, G. Bovi, D.R. Bonardi, R. Sassi

PM02 Early walking forms: Is there a relation between infants’ chosen gait strategies and their temperament? - M.C. Bisi, R. Stagni

PM03 Quantitative assessment of fundamental motor skill in children: an instrumented version of the TGMD-2 - M.C. Bisi, G. Pacini Panebianco, R. Polman, R. Stagni

PM04 Quantitative observation of the maturation of tandem gait performance in childhood: towards a new insight in the development of motor control - M.C. Bisi, S. Mandaresu, P. Tamburini, R. Stagni

PM05 The Fitness monitoring using the APPs for the smartphones: preliminary considerations and emerging issues - M. Costantini, G. Maccioni, M.R. Giovagnoli, D. Giansanti

PM06 DUALarm: a low-cost, 3D-printable device for home bimanual rehabilitation - A. Scano, A. Chiavenna, M. Caimmi, T. Dinon, M. Malosio, L. Molinari Tosatti, F. Molteni

PM07 Association between instrumental gait stability indexes and clinical scales in stroke subjects - P. Tamburini, D. Mazzoli, R. Stagni

PM08 Extraction of gait parameters from inertial sensor in side-by-side walking - C. Caramia, M. Schmid, I. Bernabucci, C. De Marchis, S. Conforto

PM09 A numerical method for the analysis of digitally recorded performances in hand-drawing tests for constructional apraxia - M. Rabuffetti, M.A. Petilli, M. Ferrarin, R. Daini

PM10 The Clarification of Floquet Multipliers in Bipedal Gait Stability - A Computer Simulation Study - W. Barker, M. Talaty

PM11 Effects of age and Parkinson’s disease on balance response to external perturbations of the base of support: an assessment through 3D rotating platform - G. Bonora, I. Carpinella, T. Bowman, D. Cattaneo, M. Ferrarin


PM13 Comparison of different clustering methods to analyse muscle synergies - S. Tanzarella, J. Jonsdottir, T. Lencioni, I. Carpinella, M. Ferrarin


PM15 Influences of inter-foot distance and base of support area on gait initiation in healthy subjects - M. Dipaola, E.E. Pavan, A. Leporini, P. Cavallari, I.U. Isaias, C.A. Frigo

PM16 Does the duration of muscle activity differ between lower limbs during standing balance? - F. Vieira Dos Anjos, T. Peixoto Pinto, M. Gazzoni, T. Vieira

PM17 How much does the change in tibialis anterior architecture affect the surface EMGs? - T. Vieira, M.C. Bisi, R. Stagni, A. Botter

PM18 Correlation between the kinematic posture and gait parameters by inertial sensors and clinical scales in subjects with neurological diseases - V. Auriemma, G. D’Addio, L. Iuppariello, N. Pappone, G. Piscosquito, B. Lanzillo, M. Cesarelli

PM19 Gait analysis of elderly in water using wearable inertial magnetic sensors - S. Fantozzi, A. Giovanardi, D. Borra, M. Cortesi, G. Gatta

Quantificational kinematic evaluation indexes of the rehabilitation outcome in hemiparetic patients - G. Di Stadio, G. D’Addio, L. Iuppariello, N. Pappone, G. Piscosquito, B. Lanzillo, M. Cesarelli

LINarm, an affordable linear end-effector device for stroke rehabilitation: preliminary tests - A. Chiavenna, A. Scano, M. Caimmi, A. Prini, M. Malosio, F. Molteni, L. Molinari Tosatti


Rehabilitation of pediatric hands with sensorized toys - N.A. Borghese, R. Mainetti, J. Essenziale, E. Cavalli, E.M. Mancon, G. Pajardi

Hierarchical data organization for effective remote telerehabilitation supervision - N.A. Borghese, J. Essenziale, R. Mainetti

Modular organization and motor-control adaptations during walking on rectilinear and curvilinear trajectories - N. Chia Bejarano, A. Pedrocchi, A. Nardone, M. Schieppati, W. Baccinelli, M. Monticone, G. Ferrigno, S. Ferrante

Effect of narrowing the base of support on kinematic and electromyographic features in cerebellar ataxia - C. Conte, M. Serrao, P. Caliandro, A. Ranavolo, L. Cuius, L. Padua

Motion analysis of a wearable and portable hand exoskeleton - M. Bianchi, F. Fanelli, A. Ridolfi, L. Governi, B. Allotta, G. Pasquini, C. Macchi, F. Vannetti

Risk analysis for exoskeletons: from research to clinics - G. D’Avenio, S. Morelli, C. Daniele, G. Maccioni, D. Giansanti, M. Grigioni

Assessment of a magneto-inertial sensors driven Inverse Kinematics approach for the estimate of multi-body joint kinematics - L. Tagliapietra, L. Modenese, E. Ceseracciu, C. Mazzà, M. Reggiani

Combination of gait analysis, musculoskeletal modeling and finite element modeling: an improved approach for the biomechanical analysis of the diabetic foot - A. Scarton, A. Guiotto, T. Malaquias, G. Sinigaglia, I. Jonkers, Z. Sawacha

The Vertical Drop Jump Test for ACL injuries prevention can be improved through kinematics, plantar pressure and EMG analysis - D. Pavan, M. Dainese, F. Cibin, A. Guiotto, Z. Sawacha

Development of new kinematic model for head and neck movement assessment in cervical dystonia patients - D. Anastasi, A. Marzegan, A. Crippa, M. Rabuffetti, L. Sciumè, A. Montesano, A. Castagna

Acceleration of the trunk during the float phase on treadmill running - L. Guariento, F. Vannetti, L. Simoni, F. Gori, A. Corvi, R. Molino-Lova, C. Macchi, G. Pasquini

The feasibility of assessing arm elevation in the scapular plane with a single inertial measurement unit with no sensor-to-segment alignment procedure - P. Picerno

GENERAL INFORMATION

ORGANISING SECRETARIAT SIAMOC 2016
Jessica Matera
IRCCS S. Maria Nascente, Fondazione Don Carlo Gnocchi Onlus, Via Capecelatro, 66 - Milano
Tel. +39-02-40308305 - Fax +39-02-4048919, E-mail siamoc2016@dongnocchi.it

CONGRESS VENUE
Centro Congressi Fondazione Cariplo, via Romagnosi, 8 - Milano
Tel. +39-02-32168201 - Fax +39-02-32168230, E-mail centrocongressi@fondazionecariplo.it

How to get there:
The Congress Center is located 250 meter from Montenapoleone station, Metro Line 3. From this station, take Via Croce Rossa, turn left into Via dei Giardini, which then becomes Via Monte di Pietà, and finally turn left into Via Romagnosi, you will find the entrance to the Centro Congressi Fondazione Cariplo on the left. There is a lack of free parking in the area, so arrival by car is not recommended.

PRECONGRESS COURSES VENUE
IRCCS S. Maria Nascente, Fondazione Don Carlo Gnocchi Onlus, Via Capecelatro, 66 - Milano
Tel. +39-02-40308305 - Fax +39-02-4048919, E-mail siamoc2016@dongnocchi.it

How to get there:
The S. Maria Nascente Center of Don Carlo Gnocchi Foundation can be reached:

a) on foot from Ippodromo station, Metro Line 5 (450 meters): take Via Pessano, turn left into Via Capecelatro, you will find the entrance to the Center on the left;

b) by bus n. 49 from Lotto station, Metro Line 1 (about 10 minutes): from Piazzale Lotto, take Via Monte Rosa for 50 meters, you will find the bus stop for the number 49 on the right. Get off at the eighth stop, Istituto Don Gnocchi. The entrance to the Center is located on the same side of the stop, about 40 meters back.

Inside the center follow the signs indicating the precongress course chosen.
OPENING HOURS OF SECRETARIAT

Wednesday 5 October: from 08:00 to 09:00 at IRCCS S. Maria Nascente, Fondazione Don Carlo Gnocchi Onlus, Via Capecelatro, 66 - Milano
from 15:00 to 19:00 at Centro Congressi Fondazione Cariplo, Via Romagnosi, 8 - Milano

Thursday 6 October: from 08:00 to 19:00 at Centro Congressi Fondazione Cariplo, Via Romagnosi, 8 - Milano

Friday 7 October: from 09:00 to 18:00 at Centro Congressi Fondazione Cariplo, Via Romagnosi, 8 - Milano

Saturday 8 October: from 09:00 to 13:30 at Centro Congressi Fondazione Cariplo, Via Romagnosi, 8 - Milano

ECM Credits

For all precongress courses and the SIAMOC Congress the accreditation to Italian ECM (Continuing Medical Education) system has been obtained for medical doctors (all specializations) and all health care professions. Numbers of ECM credits assigned:
Precongress courses 1 and 2: **4,7 ECM credits**; Precongress course 3: **4,4 ECM credits**; SIAMOC Congress: **11 ECM credits**

SOCIAL DINNER

Friday 7 October 2016, h. 20:30
Carlsberg, Via Bastioni di Porta Nuova, 9 - Milano
A typical Milanese restaurant-brewery, set in an ancient cellar, with a very informal atmosphere.

How to get there:
The Carlsberg restaurant can be reached:

a) **on foot from Centro Congressi Fondazione Cariplo** (about 1.4 km, 20 min), a characteristic walk through "nightlife in Milan": from Via Romagnosi, turn left into Via Monte di Pietà for 150 m, then turn right into Via Brera for 400 m, then continue along Via Solferino for about 800 m, up to the intersection with Via Bastioni di Porta Nuova. Here turn right and, about 30 meters ahead, you will find the Carlsberg restaurant on the right;

b) **from Turati stop, Metro Line 3** (then walk about 1 km): from Metro stop take Via Turati for 100 m, turn left into Via della Moscova and continue for 550 m up to the intersection with Via Solferino, here turn right and continue as described in a);

c) **from Repubblica stop, Metro Line 3** (then walk about 700 m): from Piazza della Repubblica take Via Monte Santo, keeping the left side. Then continue into Bastioni di Porta Nuova until you will see the Carlsberg restaurant on the left side of the service road.
ORAL PRESENTATIONS

The oral presentation language can be Italian or, for foreign speakers, English. However, Italian speakers are suggested to prepare the slides in English, to facilitate foreign participants. Oral presentations will be scheduled according to the final program defined by the Scientific Committee.

The duration of each oral presentation should be 12 minutes, 10 minutes to present and 2 minutes for questions and answers. Moderators will keep track of the presentation time to guarantee the correct observance of the scheduling.

The Slide Centre will be open every morning from 8:00 AM to 8:45 AM, during coffee breaks and buffet lunches, and during the poster session presentations.

All the speakers invited to present their works in the first morning session must deliver their presentation slides the day before the speech.

POSTER

It is suggested to write the poster in English, to facilitate foreign participants.

For poster design please follow the online guidelines. The maximum size of the posters is: 70 cm (width) x 100 cm (height).

Posters should be exposed on the scheduled day before 2:00 PM, in the slot reporting the assigned identification code.

Clinical posters will be presented on Thursday 6th October and methodological posters on Friday 7th October, from 3:00 PM to 4:30 PM.

During the poster sessions, moderators will accompany a commission for a brief presentation of the posters (1 minute to present and 1 minute for questions and answers).

It is suggested to bring print copies of the poster in A4 format for any interested participant.

Clinical posters should be exposed before 2:00 PM on Thursday and removed before 12:00 PM on Friday.

Methodological posters should be exposed on before 2:00 PM on Friday and removed before 1:00 PM on Saturday.
AWARDS

SIAMOC best papers awards
SIAMOC society offers an economic award to the best scientific papers, respectively with a clinical and a methodological content, presented at the National Congress. Elsevier BV and BioMed Central will consider the two winner papers for fast track publication as full papers on, respectively, Gait&Posture and BioMedical Engineering OnLine journals, with a mention of the prize awarded. Candidates to SIAMOC best paper awards will be all authors who have indicated, during abstract submission, their intention to participate and in which category. The choice between methodological and clinical category is exclusive. Candidates must declare they have not submitted the paper for publication to any scientific journal.

Don Carlo Gnocchi Foundation award "Silvano Boccardi"
In order to facilitate the application of instrumented movement analysis in rehabilitation, Don Carlo Gnocchi Foundation offers an economic award to the best rehabilitative paper presented at the XVII SIAMOC Congress, dedicating it to the memory of Professor Silvano Boccardi, director of the Don Carlo Gnocchi Foundation Center S. Maria Nascente of Milan from 1960 to 1975, cofounder and medical director of the Bioengineering Center established by the Foundation with the Polytechnic of Milan University, founder and director for 40 years of the school for physiotherapists of Maggiore Hospital of Milan as well as cofounder and honorary president of SIAMOC. In keeping with his continuous efforts to educate physiotherapists and to improve rehabilitation also by means of innovative technologies, the award will be assigned by an ad hoc Commission to the best conference paper (oral or poster) which includes the application of a rehabilitative intervention. Papers presented by young physiotherapists or other rehabilitation professionals will be preferentially considered. Candidates will be all authors who have indicated, during abstract submission, their intention to participate to the "Silvano Boccardi" rehabilitation award.

Stage award for young SIAMOC members
The Scientific Committee of the XVII SIAMOC Congress, announces a competition for the award of internships at movement analysis laboratories, among those made available by Supporting Members. The competition is reserved to SIAMOC members younger than 31 yrs who have indicated, during abstract submission, their intention to participate. Candidates must be the first author of the abstract and the presenter of the paper at the Congress. The awards will cover travel and accommodation costs for each internship. For the 2016 edition, a 5-days stage has been offered by:

*BTS Bioengineering srl
viale Forlanini, 40 - Garbagnate Milanese (MI), Italia*

SIAMOC award for university degree dissertation
SIAMOC society annually offers an award for university degree dissertations about instrumented movement analysis methodologies and/or clinical applications, to improve motor disorders evaluation, to enhance treatment efficacy by means of quantitative data analysis and a tailored definition of treatments. The award will be delivered during the SIAMOC congress.
ACKNOWLEDGEMENTS TO

BTS Bioengineering
cometa
circle
habilitation concept
TOTUM
Khymeia
fvr
Vega
www.vega-spa.com
FIOR & GENTZ
Orthopädietechnik mit System
COSMED
The Metabolic Company
ITOP SpA
officine ortopediche
www.itop.it
edi-ermes
PICCIN
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<tr>
<th>Time</th>
<th>Wednesday 5/10/2016</th>
<th>Thursday 6/10/2016</th>
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<th>Saturday 8/10/2016</th>
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<tr>
<td>08:00</td>
<td>Participant registration to pre-congress courses</td>
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<td>Wearable systems for motor rehabilitation (L. Chiali)</td>
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<td>Precongress course 1: Gait Analysis in patients with spasticity and brain damaged patients (A. Berti)</td>
<td>Motor intention and movement awareness in normal subjects and in brain damaged patients (A. Berti)</td>
<td>Session 5 - Movement analysis with wearable sensors</td>
<td>Wearable systems for motor rehabilitation (L. Chiali)</td>
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<td>Precongress course 2: Clinical movement analysis by means of inertial and magnetic sensors</td>
<td>Session 1 - Sensori-motor control</td>
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<td>Session 9 - Neurophysiology and movement</td>
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<td>Precongress course 3 (in collaboration with GIS Neuroscience AIFI): Movement analysis and rehabilitation: quantitative measurement of outcome</td>
<td>Session 2 - Biomechanical models and quantitative indexes</td>
<td>Clinical neurophysiology and movement analysis: towards the integration of two complementary approaches (P.M. Rossini)</td>
<td>Clinical Movement Analysis in Italy: the road traveled and future perspectives (C. Frigo)</td>
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<td>Efficacy of Gait Analysis in Clinical Decision Making and Outcomes (T. Wren)</td>
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<td>17:00</td>
<td>Opening ceremony &amp; welcome address</td>
<td>Session 3 - Poster (clinical)</td>
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<td>Opening lecture: Modular organization of the motor system and muscle synergies (E. Bizzi)</td>
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<td>Movement, music and rehabilitation: &quot;The gesture that sounds and resounds &quot;</td>
<td>Session 4 - Movement analysis in neurology</td>
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<td>Session 8 - Innovative technologies for rehabilitation</td>
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<td>User group meeting BTS</td>
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