



INTERNATIONAL
SOCIETY FOR
POSTURE & GAIT
RESEARCH



ispgr 2009



Proceedings of the XIX Conference of the
International Society for Posture & Gait Research
Bologna, Italy—June 21-25, 2009



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Proceedings of the XIX Conference of the International Society for Posture & Gait Research

Bologna, Italy—June 21-25, 2009

Editors:

**Lorenzo Chiari
Antonio Nardone**

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DEIS – Università di Bologna – BOLOGNA 2009

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ALMA MATER STUDIORUM
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PROVINCIA DI BOLOGNA

Organizing Secretariat



Welcome

Dear Colleagues and Friends,

We are very pleased to welcome you to the XIX Conference of the International Society for Posture and Gait Research in Bologna, Italy, June 21- 25, 2009. The Conference will provide, with its usual and unique hearty atmosphere, a multidisciplinary forum for basic and clinical scientists where to present and discuss the latest research and clinical findings in the field of posture and gait control and associated disorders.

We would like to remind you that this is the first time the Society holds its meeting in Italy, and Bologna undoubtedly appears as an appropriate venue since the city is home to the oldest University in Europe, funded in 1088 A.D.

Bologna became an intellectual and artistic centre that attracted the greatest minds of the Italian Renaissance in the 15th and 16th centuries. The names of those who worked in or for Bologna include important scientists who earned one of their degrees here. Bologna was the birthplace of many intellectuals such as Guido Reni (painter, 1575 - 1642), Marcello Malpighi (anatomist and histologist, 1628 - 1694), Luigi Galvani (physician and physicist, 1737 - 1798), Laura Bassi (anatomist and physicist, first female appointed to university chair in Europe, 1711 - 1788), Giuseppe Mezzofanti (cardinal, linguist and hyperpolyglot, 1774 - 1849), Guglielmo Marconi (inventor, Nobel prize in Physics, 1874 - 1937), Ottorino Respighi (music composer and conductor, 1879 - 1936).

You might also be interested in knowing that Bologna is considered the gastronomic capital of Italy, and is famous for the quality of life as well as for its universally recognized civic virtues: all aspects that will be easily "tasted" during your stay in Bologna. Today, the city offers visitors one of the best preserved historic centres in Europe. Towers, squares, churches and buildings are interwoven into a network of porticos spanning an overall length of over 37 km (23 miles), an ideal pathway for pleasant walks and charming views in an architectural shelter from both the beaming sun and the pouring rain.

During your stay in Italy, you will hear one of the most popular Italian words: '*ciao*', pronounced "chaow". It originated from the Venetian language, then was adopted by the Italian dictionary and finally spread to English and many other languages. This is the reason for explaining a little bit its meaning. The word derives from the Venetian phrase '*s-ciào vostro*', literally "I am your slave". The expression was simply a generic promise of good will among friends. The greeting expression was later shortened to *ciào*, lost its servile meaning and was used as an informal salutation. In contemporary Italian, *ciao* is used both as an informal hello and goodbye. The greeting has several variations. For instance, a doubled *ciao* means "Goodbye". Tripled or quadrupled, and quickly, it means "Bye, I'm in a hurry!". Pronounced with a long "a", it means "Hello, I'm so glad to meet you!". The latter meaning fits with our wish to meet you all here.

We really hope that each of us will benefit from both the scientific and social events of the conference, meeting old friends and making new international connections. In this context, we wish to thank particularly the help of the International and Italian Scientific Committee for the effort in reviewing the abstracts and the continuous exchange of information and advices. We trust your stay in Italy during ISPGR will be rewarding.

Ciao!

Lorenzo Chiari and Antonio Nardone
Conference Chairmen





Scientific Committee

John Allum	Basel University Hospital, CH
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Wiebren Zijlstra	University of Groningen, NL

Organizing Committee

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Antonio Nardone (Chair)	Università del Piemonte Orientale, Novara & Fond. "S. Maugeri", Veruno, I
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Martina Mancini	DEIS, Università di Bologna, I
Roberto Sottile	DEIS, Università di Bologna, I
Marco Godi	Fondazione "S. Maugeri", Veruno, I

General Information

Venue

Palazzo Re Enzo, Piazza Nettuno 1/c, Bologna

Located in the centre of Bologna overlooking one of the most beautiful squares in the world, Palazzo Re Enzo combines the majestic beauty and fascination of an ancient building with the best in modern facilities. Recently refurbished to meet the most demanding requirements, this beautiful listed building is ideally situated in the heart of the old town. Built in 1200 on the site of the old palace (Palatium vetus), seat of the court of justice, Palazzo Re Enzo was known as the 'legal' building. All that remains is the northern Romanesque wing and the Torre dell'Arengo, the bell-tower housing the 'Campanazzo' bell cast by Aristotele Fioravanti to toll only when momentous events occurred. In 1245 the city governor's residence (Palazzo del Podestà) and that of the captain of the people (Palazzo del Capitano del Popolo) were built between these two buildings. At the end of the 15th century the lord of Bologna commune, Giovanni II Bentivoglio, ordered the Palazzo to be rebuilt to the design of Aristotele Fioravanti, a Bolognese architect already well known in Eastern Europe for his contribution to the building of the Kremlin Palace in Moscow. Palazzo Re Enzo takes its name from Enzo, King of Sardinia, who was imprisoned here from 1249 to 1271. Enzo, the natural son of the Emperor Federico II, was captured by the Bolognese at the battle of Fossalta and jailed in the fortress until his death in 1271. The story goes that his imprisonment was worthy of a king, however, and that Enzo spent many pleasant hours in the company of nobles reading poetry and enjoying the finer things of life. He also wrote several love poems in the Italian language which was beginning to evolve in those years. After Enzo's death the palace was given his name in honour of its illustrious guest.

The University of Bologna

The University of Bologna's history is one of great thinkers in science and the humanities. The institution that we today call the University began to take shape in Bologna at the end of the 11th century, when masters of grammar, rhetoric and logic began to devote themselves to law, inspired by the Byzantine Justinian Code. The first recorded scholars were **Pepone** and **Irnerius**, the latter of whom was defined by the former as "lucerna iuris". In 1158, at the urging of four doctors (thought to be pupils at the University), Frederick I promulgated the Constitutio Habita, in which the University was legally declared a place where research could be performed independently from any other power.

In the 14th century, so-called "artists" — scholars of medicine, philosophy, arithmetic, astronomy, logic, rhetoric, and grammar — began to collaborate with the school of jurists. In 1364, the teaching of theology was instituted. Dante Alighieri, Francesco Petrarca, Guido Guinizelli, Cino da Pistoia, Cecco d'Ascoli, Re Enzo, Salimbene da Parma and Coluccio Salutati all studied in Bologna. In the 15th century Greek and Hebrew studies were instituted, and in the 16th century those of "natural magic", which we would refer to as, "experimental sciences." The philosopher Pietro Pomponazzi upheld the study of the laws of nature against the traditionalist position of theology and philosophy. Representative figures of this period were Ulisse Aldrovandi, whose contributions ranged from pharmacopoeia to the study of animals, fossils, and marvels of nature which he collected and classified, and Gaspare Tagliacozzi who completed the first studies of plastic surgery. In the 17th century, which is thought of as the "golden era" of the University, medicine coincided with the teachings of **Marcello Malpighi** and students began to employ the microscope for anatomical research. By this time, the University's fame had spread throughout Europe and it was a destination for many illustrious guests. Famous scholars and students included Pico della Mirandola and Leon Battista Alberti, who devoted themselves to canon law,

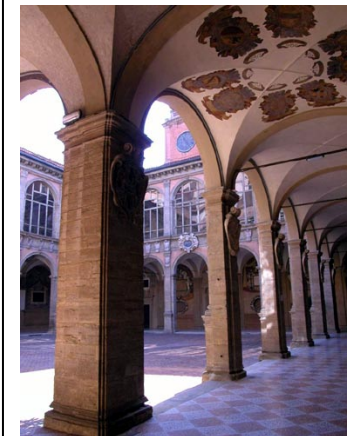


and **Nicolaus Copernicus** who began his astronomical observations while studying pontifical law. Paracelsus (aka Paracelso), Raymond of Peñafort, Albrecht Dürer, St. Carlo Borromeo, Torquato Tasso, and Carlo Goldoni all spent time at the University. With the advent of the Industrial Revolution in the 18th century, the University promoted scientific and technological development. In this period came the studies of **Luigi Galvani** who was one of the founders of modern electrotechnical studies (along with Alessandro Volta, Benjamin Franklin and Henry Cavendish). Following the establishment of the United Italian State came a period of great prosperity for the University in which the figures of Giovanni Capellini, Giosuè Carducci, Giovanni Pascoli, Augusto Righi, Federigo Enriques, Giacomo Ciamician, and Augusto Murri stand out. In 1888 the eighth centennial of the University was celebrated with a grand ceremony. Representatives from universities all over the world convened in Bologna to honour the "mother of universities," and celebrate their common roots and ideals of progress and tolerance. The University maintained its central position on the scene of global culture until the period between World War I and World War II. As its own influence declined and other universities came to prominence, Bologna was called upon to forge relationships with institutions in the most advanced countries to modernise and reinvigorate its activities. Among the many challenges which it has met with success, Bologna committed itself to the European dimension which has now led to adoption of the new university system.



Notable members of the University of Bologna

Irnerius, Gratian, Patriarch Heraclius of Jerusalem, Stephen of Tournai, Bulgarus, Martinus Gosia, William of Tyre, Rambertino Buvaelli, Bettisia Gozzadini, William of Saliceto, Guido Guinizelli, Dante Alighieri, Manuel Chrysoloras, Francesco Petrarca (aka Petrarch), Coluccio Salutati, Leon Battista Alberti, Nicolaus Copernicus, Georgius de Drohobycz, Albrecht Dürer, Giovanni Pico della Mirandola, Girolamo Cardano, Ignazio Danti, Girolamo Maggi, Giovanni Antonio Magini, Paracelsus, Giovanni Cassini, Ulisse Aldrovandi, Marcello Malpighi, Laura Bassi, Maria Gaetana Agnesi, Luigi Galvani, Carlo Goldoni, Giosuè Carducci, Giacomo Ciamician, Camillo Golgi, Giovanni Pascoli, Pellegrino Rossi, Severino Ferrari, Umberto Eco, Vincenzo Balzani, Romano Prodi, Augusto Righi, Carlo Rovelli, Pier Paolo Pasolini.



Conference Chairmen

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GAIT 2010

EVERY STEP COUNTS

The 3rd International Congress on Gait & Mental Function

THE INTERPLAY BETWEEN WALKING, BEHAVIOR AND COGNITION

Washington D.C., USA, February 26-28, 2010

Join key players and new investigators at **GAIT 2010** for a rich collaborative environment and a unique and multidisciplinary focus on the reciprocal interactions and consequences of gait and mental functions. A rich scientific program includes an unparalleled focus on the effects of physical and cognitive training on walking and daily function, as well as a novel focus on exercise training, dual task performance, and falls.

Submit your abstract by: **September 8, 2009**

WWW.KENES.COM/GAIT



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1-3 Rue de Chantepoulet, PO Box 1726, CH-1211 Geneva 1 Switzerland
Tel:+ 41 22 908 0488; Fax:+ 41 22 906 9140; E-mail: gait@kenes.com; Web: www.kenes.com/gait

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Money/Currency/Banks

The official currency in Italy is Euro (€). More information about the latest currency conversions can be found on www.xe.com/ucc. All major credit cards are accepted in hotels, restaurants and shops. Banks are usually open from Monday to Friday from 8:30 to 13:30 and from 14:30 to 16:00.

Tipping

Service is usually included in the price in bars and restaurants. Tips are however welcome.

Climate

Climate in June is generally mild and sunny. Average temperatures in Bologna range from 21° to 28° Celsius.

Local Time

From the end of March until the end of October, Italian time goes from GMT+1 to GMT+2 (GMT=Greenwich Mean Time).

Electricity

The electricity power supply in Italy is at 220 Volt (European standard plug).

Safety Precautions

Bologna is as safe as any other European tourist city. The participants are advised to take the usual prudent precautions.

Insurance

The conference organisers cannot accept liability for personal injuries sustained or for loss or damage of property belonging to congress participants or their accompanying persons, either during or as a result of the ISPGR conference. Please check the validity of your own insurance.

Official letters of invitation

Official Letters can be required and issued by the congress, upon request, without implying any obligation or financial engagement from congress organisers.

VISA

Participants of the Countries requiring Visa should obtain documentation from the Italian Embassy or consulate in their own Country. A valid passport is required.

Registration desk

The registration desk, situated at the entrance of the conference venue, will open with the following schedule:

Sunday, June 21	10:00 – 20:00
Monday, June 22	08:00 – 18:30
Tuesday, June 23	08:00 – 15:00
Wednesday, June 24	08:00 – 18:30
Thursday, June 25	08:00 – 19:30

Exhibition

A technical and scientific exhibition will be held in the conference area. All Participants are welcome to visit the exhibition area. The exhibitors can collect their badges at the Reception Desk on Sunday June 21st from 10:00 to 20:00. The exhibition is open during Conference's works.

Speakers' ready room

All speakers have to go to this room to check the projection of their presentation at least three hours before their speech. The Speakers' Ready Room is situated on the first floor of Palazzo Re Enzo next to Salone del Podestà (plenary room). Opening hours:

Sunday, June 21	12:00 – 20:00
Monday, June 22	08:00 – 17:30
Tuesday, June 23	08:00 – 14:30
Wednesday, June 24	08:00 – 17:30
Thursday, June 25	08:00 – 15:00



Speaker information

Rooms are equipped with high resolution computer projection systems. Use of laptop during presentation is not possible. It is not possible to use slides (transparencies) or VHS.

Speakers are invited to refer to the Speakers' Ready Room **at least 3 hours before** their presentation with their sound and video files saved in CDs, DVDs and USB memory sticks. Presentations may also be downloaded directly from PCs/Macs in the Speakers' Ready Room. Presentations in PPT files should be delivered in Microsoft Office Xp, 2003 or Office 2007 format. Presentations created with OpenOffice or Apple Keynote will not be accepted. Accepted video formats: .MPG, .WMV; otherwise you have to bring your presentation to the Speakers' Ready Room *at least 4 hours before* your presentation is scheduled, in order to have time to check or convert your videos with the technical staff. Standard Windows fonts only are allowed; otherwise font must be copied to the same folder as the presentation.

Mac users should save their file in Power Point format. If there are video clips inside their presentations, they have to select option "quick time" to save clips in .MPG, .AVI. It is impossible to project a video clip together with a computer file, as each room is equipped with only one projector, to be used for video clip projections or laptop presentations.

Posters

Accepted posters will be displayed by the authors during two sessions, respectively from 22 to 23 June (Session 1) and from 24 to 25 June (Session 2). Authors in each session are invited to stand at their poster for presentation and discussion according to the following schedule:

Monday, June 22	Session 1 - odd numbered posters P.1 to P.191
Tuesday, June 23	Session 1 - even numbered posters P.2 to P.192
Wednesday, June 24	Session 2 - odd numbered posters P.193 to P.383
Thursday, June 25	Session 2 - even numbered posters P.194 to P.384

Posters must not exceed 100 (width) x 140 (height) cm. Material for hanging will be provided by the organization.

Badge

At the registration, each participant will be given a personal untransferable badge to be worn during the conference works and at the special events. The badge allows admittance to exhibition and congress areas. The badge will be mandatory to have access to Palazzo Isolani, seat of the Social Dinner.

Certificate of attendance

Certificates of attendance will be printed at the reception desk upon request.

Coffees and lunches

Coffee breaks and lunches will be served in several points on the second floor of Palazzo Re Enzo. Special food needs that you mentioned during the registration were considered, but if you need help please contact the registration desk.

Luggage and cloakroom

A luggage room will be available for free on the ground floor.

Opening hours:

Sunday, June 21	12:00 - 20.00
Monday, June 22	08:00 - 18:30
Tuesday, June 23	08:00 - 14:30
Wednesday, June 24	08:00 - 18:30
Thursday, June 25	08:00 - 19:30

Lost and found

Please refer to the registration desk for lost and found items.

No smoking policy

Smoking is not allowed inside the congress venue.

How to reach the Conference venue

Bologna has an excellent network of surface public transportation. Bus-lines operating near the congress site are number 11, 13, 14, 17, 18, 19, 20, 25, 27, 29, 30, 86, A, B, BLQ Aerobus stopping at "Rizzoli" or "Palazzo Re Enzo". Ticket is purchasable also onboard at a fee of 1€ (need to have 1€ coin



with you) and is valid for 60 minutes. Info: www.atc.bo.it. Taxi service is located at the corner between Palazzo Re Enzo and Via Rizzoli.

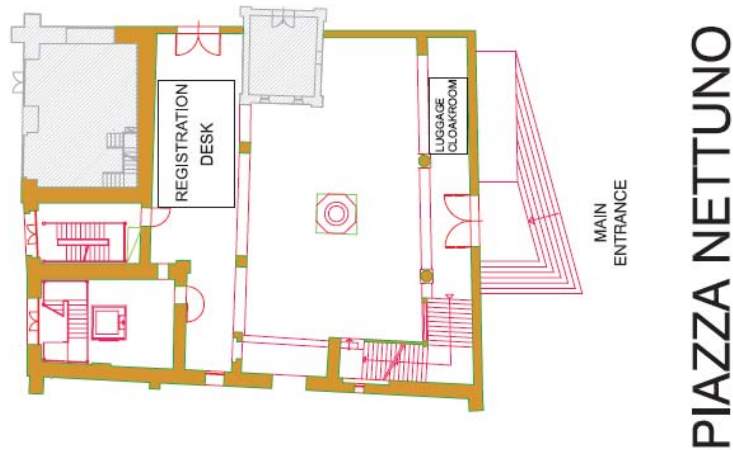
Useful phone numbers

(only calls from Italy)

POLICE	112 (State Police) or 113 (Carabinieri)
FIRE DEPARTMENT	115
MEDICAL EMERGENCY	118
RADIOTAXI	051534141 or 051372727
COSEPURI – (Private Car Service)	051519090

Conference Venue & Poster Layout

PALAZZO RE ENZO - GROUND FLOOR



VIA RIZZOLI

PALAZZO RE ENZO - FIRST FLOOR



PALAZZO RE ENZO - SECOND FLOOR



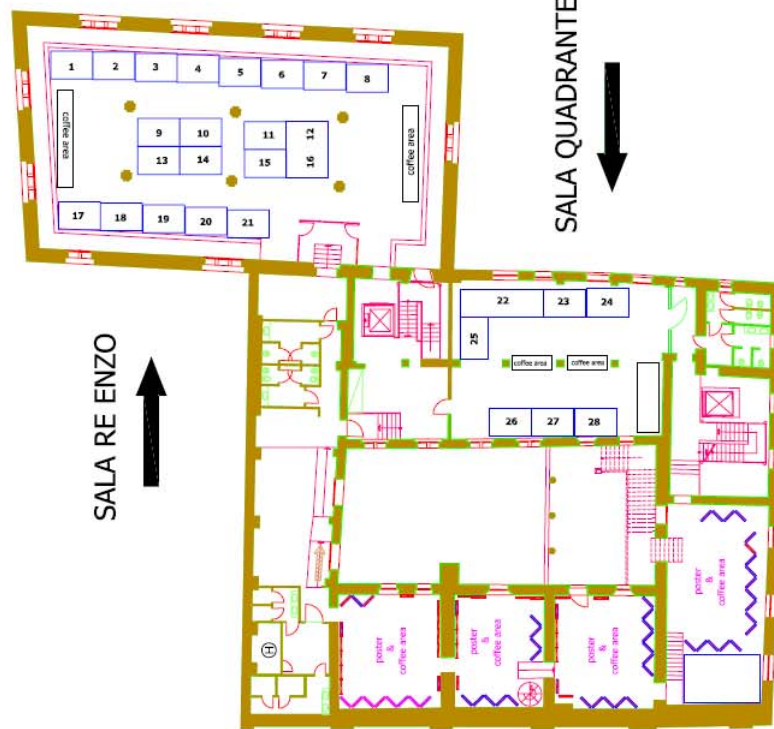
Exhibitors

The Organizing Committee gratefully acknowledges the support of the following sponsors:



Exhibitor Booth Layout

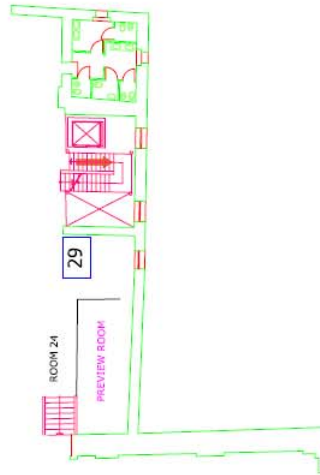
PALAZZO RE ENZO - SECOND FLOOR



ISPGR 2009

COMPANY NAME	BOOTH NUMBER	PLACEMENT
Breco S.p.A.	1	SALA RE ENZO
RGHO S.p.A.	2	SALA RE ENZO
Phoenix Technologies Inc.	3	SALA RE ENZO
SIHT Realty Motion Systems GmbH	4	SALA RE ENZO
AMIT	5	SALA RE ENZO
BTS Bioengineering S.p.A.	6	SALA RE ENZO
MOBROBERTS BV	7	SALA RE ENZO
Telscan Inc.	8	SALA RE ENZO
Debyz INC.	9	SALA RE ENZO
Loran Engineering S.r.l.	10	SALA RE ENZO
Innovative Sports Training Inc.	11	SALA RE ENZO
Mercury Internazionale S.p.A.	12-16	SALA RE ENZO
Northern Digital Inc.	13	SALA RE ENZO
Novel GmbH	14	SALA RE ENZO
Radler Italia S.r.l.	15	SALA RE ENZO
Conanplus GmbH	17	SALA RE ENZO
Xenon Technologies B.V.	18	SALA RE ENZO
STM Microelectronics	19	SALA RE ENZO
Aurbin S.r.l. - Vison Peak - CoHills	20-21	SALA RE ENZO
Sam Instruments ApS/ptex	22	SALA QUADRANTE
PHI Technologies LTD	23	SALA QUADRANTE
Aerotech-Lab	24	SALA QUADRANTE
Genex Lab - High Tech Medical S.r.l.	25	SALA QUADRANTE
Codemotion	26	SALA QUADRANTE
Focalink B.V.	27	SALA QUADRANTE
RS Scan International	28	SALA QUADRANTE
Diagnostik Support S.r.l.	29	ROOM 24

PALAZZO RE ENZO FIRST FLOOR



Exhibitors' Short Presentation

Aertech-Lab [Floor II, Sala del Quadrante, Booth 24]

The research fields of the AER-TECH Lab - Automation, Electronics and Bioengineering: Technologies for Manufacturing and People - aim at obtaining industrial and civil applications for the automotive, electronics, informatics, telecommunication and biomedical engineering markets. The industrial research and technology transfer objectives regarding the "People" area are in particular functional evaluation and neuromuscular-skeletal rehabilitation systems, prosthesis and assistive robots. **Contact:** Prof. Angelo Cappello // DEIS, University of Bologna // Viale Risorgimento, 2 // 40136 Bologna - Italy // Ph. +39 051 2093097 // Fax. +39 051 2093073 // Email: angelo.cappello@unibo.it

Agencinox [Floor II, Sala del Quadrante, Booth 22]

Represented over 60 countries over the world, AGENCINOX provide you 50 years of experience in the stainless steel field. AGENCINOX designs, manufactures and sell high quality stainless steel medical ware and medical furniture for the healthcare market. AGENCINOX means also products for: laboratory, food industry, chemical industry and realise all your project as subcontractor. **Contact:** Z.I. 89110 Aillant sur Tholon, France // Ph : 03 86923900 // Fax 03 86923907 // e-mail: france@agencinox.com // Export : +33 3 86923927 // Fax +33 3 86915442 // E-mail: contact@agencinox.com

AMTI [Floor II, Sala Re Enzo, Booth 5]

AMTI has collaborated with top researchers to develop a wide range of force plates and instrumented biomechanics equipment specifically suited for the study of gait and balance. We offer many standard six-degree-of-freedom products and also regularly partner with individuals to create custom solutions for highly specific applications. Our standard products include mounted force plates, portable force plates, instrumented treadmills, instrumented stairs, and instrumented walkers. We are also heavily involved in the field of biotribology, where our joint simulator machines are the industry standard for the evaluation of joint prosthetics. **Contact:** 176 Waltham Street // Watertown, MA 02472, USA // Ph: +1 (617)926-6700 // Fax: +1 (617)926-5045 // www.amti.biz

Aurion [Floor II, Sala Re Enzo, Booth 21]

Aurion S.r.l. deals with high technology devices for Medicine and Research in movement analysis. Aurion produces and commercializes worldwide ZeroWire product line, dedicated to surface electromyography, clinical protocols for movement analysis and specializes in four different segments: Neurology, Rehabilitation, Orthopedics, Neurophysiology and Sport Science. **Contact:** Viale Certosa, 191 // 20151 Milano - Italy // Ph: +39 02 87387000 // Fax : +39 02 33499083 // Email: aurion@aurion.it // www.aurion.it

Bracco [Floor II, Sala Re Enzo, Booth 1]

Bracco is an international Group active in the healthcare sector through Bracco Imaging (diagnostic imaging), Pharma (prescription and over the counter drugs), Acist (advanced injection systems based in Minneapolis), and the Centro Diagnostico Italiano diagnostic clinic in Milan. The Bracco brand is widely known in Italy for its over-the-counter products, both pharmaceutical and dietetics. The product range includes Cebion, Xamamina, Euclorina and the Alfa eye-drops product line. **Contact:** Ph: +39 02 21771 // Fax: +39 02 26410678 // www.bracco.com

BTS Bioengineering [Floor II, Sala Re Enzo, Booth 6]

BTS Bioengineering, world leader in the technologies of movement analysis, produces innovative scientific instrumentation to support the activities of physicians, neurologists, engineers and researchers that require accurate and objective information relevant to their work. BTS solutions: integrated systems for clinical movement analysis - SMART-D; Systems for acquisition and processing of EMG signals - FREEEMG; Posture analysis systems - GEMINI; Optoelectronic systems for breathing measurement - OEP SYSTEM. **Contact:** Viale Forlanini 40 // 20024 Garbagnate

Milanese (MI), Italy // Ph: +39 02 36649000 // Fax: +39 02 36649024 // www.btsbioengineering.com

Charnwood Dynamics, Ltd [Floor II, Sala del Quadrante, Booth 26]

Codamotion is the complete solution for real-time portable 3D movement measurement and analysis; manufactured and supported by Charnwood Dynamics Ltd. Portable and lab-based Codamotion systems can operate with a wide range of complimentary devices such as force plates and EMG systems. Established in 1988, Charnwood Dynamics prides itself on a reputation for strong technical support and working closely with the users of its products throughout the world. **Contact:** Victoria Mills Fowke Street // Rothley Leicestershire LE7 7PJ, UK // Ph: +44 (0) 1162301060 // Fax: +44 (0) 1162301857

Contemplas, Gmbh [Floor II, Sala Re Enzo, Booth 17]

Contemplas has created with their motion analysis software TEMPLO an advanced video analysis software for the fields of biomechanics, medicine and sports, which is up-to-date with the latest video and image technology (HDV and Highspeed video) and can be used as a platform for multi device data acquisition platform, such as forceplates, EMG and pressure measurement systems. The software can be used for (clinical) gait analysis, running analysis, treadmill analysis, posture analysis and general motion analysis of human or animal movements (e.g. sports). Based on a flexible database structure this video analysis system offers the possibility to save recurrent workflows and though provides a maximum of efficiency in the daily work with the patient or the athlete. **Contact:** Albert-Einstein-Straße 6 // D-87437 Kempten // Ph: +49 831 25436920 // Fax: +49 831 5645328 // Email: mayer@contemplas.com // www.contemplas.com

Delsys, Inc [Floor II, Sala Re Enzo, Booth 9]

Delsys designs and markets a variety of products to detect and measure Electromyographic (EMG) signals, the very low level electrical signal that is generated in a muscle when it contracts. Our innovative technology is used by researchers and clinicians in over 750 sites in 43 countries throughout the world. **Contact:** 650 Beacon Street Boston, 02141 MA, USA // Ph: +1 (617) 236-0599 // delsys@delsys.com

Diagnostic support, Srl [Floor I, Room 24, Booth 29]

Diagnostic Support is a leader in design and production of systems for postural investigation, which markets worldwide. Over the past 20 years, the scientific director Dr. Piero Galasso has developed a technology called today DBIS ® (Digital Images Scanning) for a thorough study of the entire posture standing on and while walking. For a careful validation of the methodology the Diasu Research Center worked in collaboration with a Multidisciplinary Scientific Committee, which is named Postural Biomedicine Team, composed of over 20 university and hospital centers. **Contact:** Diagnostic Support s.r.l. // Via Dora, 1 // 00198 Roma, I // Ph: +39 06 8537141 // Fax: +39 06 85355087 // Email: info@diasu.com

Forcelink [Floor II, Sala del Quadrante, Booth 27]

ForceLink is the specialist for gait systems for sport, rehabilitation and research applications. ForceLink offers forceplates and a wide range of instrumented treadmills. The instrumented treadmills range from 1D- to 3D-, both in single and dual belt-systems. Sizes are between a standard treadmill and extreme sizes like 3x6 meter. ForceLink also develops unique solutions for institutes acting in the biomedical area. In Bologna, the newest application treadmill with visual and auditory Cueing will be presented. **Contact:** ForceLink B.V. // Industrieweg 6G, 4104AR Culemborg, NL // Ph: + 31 (0) 345707007 // Fax: + 31 (0) 345707442 // Email: Info@forcelink.nl

Forma [Floor II, Sala del Quadrante, Booth 25]

FORMA offers to all professionals working in public health and private a wide range of refresher courses to fulfill not only to

the Continuing Medical Education but primarily to provide a comparison with professional experts of different disciplines involved. **Contact:** Piazza Taormina, 10 // Spinea (VE), I // Ph: +39 041 999609 // Fax: +39 041 999196 // Email: info@formaitalia.it // www.formaitalia.it

Gaitrite [Floor II, Sala Re Enzo, Booth 20]

CIR Systems Inc. is the manufacturer of several industrial and medical instruments, including GAITRite. GAITRite portable walkway system is the world leader in temporospatial gait analysis. GAITRite measures cadence, step length, velocity and other gait parameters. Assess step-to-step symmetry and variability to determine dynamic balance and predict fall risk. **Contact:** 60 Garlor Drive // Havertown, PA 19083, USA // Ph: +1 610 4494879 // Fax: +1 610 8532925 // E-Mail: mike@gaitrite.com // www.gaitrite.com

High Tech Medical, Srl [Floor II, Sala del Quadrante, Booth 25]

In High Tech Medical we develop, manufacture and market special needles and advanced medical devices within interventional radiological –urological – hematological fields-posture analyzers. High Tech Medical s.r.l. has an established distribution network in Europe, South America, Africa and in many Asia-Pacific countries using national distributors. **Contact:** Via S.Pertini 4/B // 41039 San Possidonio (MO), I // Ph: +39 0535 38405 // Fax: +39 0535 53138 // Email: sales@hightechmedical.net

Innovative Sports Training, Inc [Floor II, Sala Re Enzo, Booth 11]

Innovative Sports Training is proud to provide *The MotionMonitor*, a totally integrated 3D motion analysis system for use in biomechanical research and clinical applications involving the analysis of complex human movements such as for Gait Analysis, Balance Assessment and Biofeedback. Data from electro-magnetic trackers, active markers or passive markers with EMG, force plates, VR displays, video, and other analog devices are synchronously collected through one platform and presented in real-time. **Contact:** 3711 North Ravenswood, Suite 150 // 60613 Chicago, IL, USA // Ph: +1 773 2446470 // Email: support@innsport.com sales@innsport.com // www.innsport.com

Kistler Italia [Floor II, Sala Re Enzo, Booth 15]

50th Year Anniversary of KISTLER Group. Kistler sensors are applied in different Process Applications: Injection Molding, Engine Development, Manufacturing, Biomedical Applications, Vibrations Analysis. Kistler platforms are used to study kinetics, especially in the following applications: Gait Analysis; Sport (Studio Performance); Basic movement patterns. **Contact:** Kistler Italia s.r.l. // Ph: +39 02 4812751 // Fax: +39 02 4812821 // Email: info.it@kistler.com // www.kistler.com

LorAn Engineering, Srl [Floor II, Sala Re Enzo, Booth 10]

LorAn Engineering Srl is an Italian company established in 2001 by people with more than 10 years experience in developing and selling systems in the orthopaedic field. Inside the company specialized electronics, biomechanics and informatics engineers cooperate with doctors and researchers from different hospital and university in Italy and outside Italy to develop and improve equipments in biomedical market. LorAn produces pressure platforms, insoles for pressure analysis, products used in rehabilitation market as static postural equipment, dynamic postural platform, equipment for hand rehabilitation, Actigraph, wireless accelerometer network. LorAn sells its products in different countries and has distributors in Germany, French, Spain, Greece, Croatia, Swiss, Hungary, Japan. **Contact:** Via B. Buozzi 25 // 40013 Castel Maggiore (BO), I // Ph: +39 051 6325552 // Fax: +39 051 6325203 // Email: info@loran-engineering.com // www.loran-engineering.com

McRoberts, Bv [Floor II, Sala Re Enzo, Booth 7]

McRoberts provides innovative solutions dedicated to movement technology using sensitive body fixed sensors, facilitated by internet based analysis. We are inviting you to our booth (no 7) for a demonstration of the DynaPort Application Range, including

the DynaPort GaitTest and SwayTest (Performance Based) and the MoveMonitor (Activities of Daily Living). Research in partnership with the clinical community and EU Project SensAction-AAL has validated our methods and assures the products are value to quality of life. **Contact:** Raamweg 43 // 2596 HN The Hague, NL // Ph: +31 703106462 // Mobile: +31 651355745 // Fax: +31 703614103 // Email: info@mcroberts.nl

Mercury Internazionale, Spa [Floor II, Sala Re Enzo, Booth 12-16]

Mercury International Spa has over thirty years of working experience in the field of medical posturography, providing the best solution in diagnostics and rehabilitation in response for medical requests, and has the exclusive representation of American systems Neurocom, considered the world leader of this market sector. **Contact:** Viale G.B. Colleoni, 25 // Palazzo Pegaso Ingr. 3 // 20041 Agrate Brianza (MI), I // Ph: +39 039 650211, +39 039 6058494 // Fax: +39 039 653522 // Email: info@mercuryinternazionale.eu // www.mercuryinternazionale.eu

Northern Digital, Inc [Floor II, Sala Re Enzo, Booth 13]

The Optotrak Certus motion capture system provides accurate, real-time 3D and 6DOF data. It is considered the gold standard in research-grade motion capture. Now introducing the 3D Investigator motion capture system: experience the quality of an NDI system, at a cost-effective price. **Contact:** NDI International Headquarters (Canada) // Ph: +1 (877) 6346340 // Email: info@ndigital.com // www.ndigital.com // NDI Europe GmbH (Germany) // Ph: +49 (7732) 9391900 // Email: info@ndieurope.com // www.ndieurope.com // NDI Asia Pacific (Hong Kong) // Ph: +(852) 2802 2205 // Email: APinfo@ndigital.com // www.ndigital.com

Novel, Gmbh [Floor II, Sala Re Enzo, Booth 14]

Novel is quality in pressure distribution measurement and offers a variety of systems to allow maximum versatility in pressure measurement applications. From research institutions to medical clinics to private industry, novel manufactures pressure measurement systems that are accurate and reliable for all testing requirements. Please visit our website for detailed information on our product families emed, pedar and pliance. **Contact:** Ismaninger Strasse 51 // 81675 Munich, Germany // Ph: +49 (0) 894177670 // Fax: +49 (0) 8941776799 // Email: novel@novel.de // www.novel.de

Pal Technologies, Ltd [Floor II, Sala del Quadrante, Booth 23]

PAL Technologies develops and supplies solutions for quantifying participation in free-living daily activities. The activPAL™ physical activity logger records posture changes (sit-stand and stand-sit) together with the primary activities of sitting, standing and stepping over a seven day period. The activPAL™, by characterising limb acceleration into functional activities, allows patterns of upright activity and sedentary behaviour to be analysed and related to disease progression. **Contact:** PAL Technologies Ltd // 141 St James Road // Glasgow G4 0LT, UK // Ph: +44 (0)1413038380 // Fax: +44 (0)1415526085 // Email: info@paltechnologies.com // www.paltechnologies.com

Phoenix Technologies, Inc [Floor II, Sala Re Enzo, Booth 3]

PhoenIX Technologies Inc., headquartered in Canada, makes high performance 3D motion capture systems for both the scientific community and the entertainment industry. Visualeyez™ is a family of innovative, real-time, active-optical motion capture systems developed to track 3D motions and deliver their contents with the highest accuracy. Unique features like wide 90° operation angle, fully automatic calibration and 100% reliable real-time operation give you the best technology can offer. **Contact:** 4302 Norfolk St. // Burnaby, B.C. Canada V5G 4J9 // Ph: +1 604-3213238 // Fax: +1 604-3213286 // www.ptphoenix.com

RGMD, Spa [Floor II, Sala Re Enzo, Booth 2]

RGMD produces and distributes Medical Devices for Functional Diagnostic and Rehabilitation with therapeutic methods based on the Evidence Based Medicine criterions in collaboration with qualified Research Centers and Universities. RGMD is the official technical scientific partner of FISG - Ice Sport Italian Federation, figure sector, FGI - Gymnastics Italian Federation, FIS - Fencing Italian Federation, and FIJLKAM - Judo, Wrestling, Karate, Martial Arts Italian Federation. **Contact:** Via Rolla 13/13 // 16152 Genova, I // www.rgmd.it

RS Scan International [Floor II, Sala del Quadrante, Booth 28]

RSScan International offers the customer affordable, professional solutions for highly accurate dynamic pressure measurements in various configurations, with the best specifications to obtain an accurate result, combined with the clearest and easiest user interface. We have selected resistive sensor technology in order to meet the technical requirements involved in measuring high speed dynamic movements. Thanks to our proprietary resistive sensors with their low level of hysteresis, we are capable of measuring at speeds up to 500 Hz (500 frames per second). **Contact:** Lammerdries-ooost 27 // B-2250 Olen, Belgium // Email: sales@rsscan.com // www.rsscan.com

SAM Instruments [Floor II, Sala del Quadrante, Booth 22]

SAM Instruments provides new way of anatomical measurements of the posture in 3 D. The modelisation of the whole body, is fast, reliable, accurate, simply. It is now easy to evaluate the consequences of the modification of the position on the remainder of the body. With no X-ray, our firm improves diagnosis and follow-up of postural disorders. We are promoting research into therapies and preventing measures. **Contact:** <http://www.saminstruments.com>

SIMI Reality Motion Systems, Gmbh [Floor II, Sala Re Enzo, Booth 4]

SIMI provides video based 2D/3D motion analysis systems. Simi Motion is a full video based system. All data are based on several (high speed/resolution) cameras. The video based data make the system transparent, easy to understand and easy to use while providing a high quality and fast measurement for clinical analysis. Simi just released the new video real time tracking on recorded videos. Simi systems have an open hardware design with of the shelf hardware. This makes the systems very flexible and easy to configure. All kind of setups, from small 2D to extensive 3D systems are possible for all clinical use cases. All analogue data like EMG, force plates, pressure measurement or others can be synchronized and integrated. **Contact:** Max-Planck-Str. 11 // D-85716 Unterschleissheim, D // Ph: +49 893214590 // Fax: +49 8932145916 // Email: sales@simi.com // www.simi.com

STMicroelectronics [Floor II, Sala Re Enzo, Booth 19]

STMicroelectronics is a global leader in developing and delivering semiconductor solutions across the spectrum of microelectronics applications. An unrivalled combination of silicon and system expertise, manufacturing strength, Intellectual Property (IP) portfolio and strategic partners positions the Company at the forefront of System-on-Chip (SoC) technology and its products play a key role in enabling today's convergence markets. For informations about ST products please contact the ST sales offices in your country. **Contact:** www.st.com

Technogym, Spa [Floor II, Sala del Quadrante, Relax area]

Technogym is a world leader in the design of fitness equipment for private homes, fitness clubs, hotels, spas, rehabilitation centers, corporate gyms, universities, professional sports facilities and beyond. The company was established in 1983 by Mr. Nerio Alessandri, founder and

president of Technogym SpA, and today it has over 1,600 employees. At Technogym, the philosophy and business practice, is based upon a deep commitment to the concepts of Wellness, innovation and social responsibility. **Contact:** Enrico Manaresi // International PR & Media Relations Manager // Ph: +39 054 756047 // Fax: +39 054 7650550 // Email: emanaresi@technogym.com // www.technogym.com

Tekscan, Inc [Floor II, Sala Re Enzo, Booth 8]

Tekscan's unique pressure sensing systems use thin, flexible, high-resolution pressure sensors for a variety of applications where accurate, detailed pressure distribution measurements are required, including posture and gait analysis. **Contact:** Christina Novak // Sales & Marketing Assistant // Ph: +1 617 4644500x344 // Fax: +1 617 4644266 // Email: cnovak@tekscan.com

Xsens Technologies, Bv [Floor II, Sala Re Enzo, Booth 18]

Xsens has strong expertise in biomechanics and inertial sensor technology. To date Xsens has invested more than 50 man years in sensor and software research and development. Thousands of Xsens inertial motion sensors have already been deployed in challenging human and machine motion applications such as motion capture, training & simulation, biomechanics, marine technology and automotive. Xsens' customers include Daimler, PGA, Össur, Roessingh Research and Development, TNO, INAIL, Electronic Arts, Sony Computer Entertainment, and others. The combination of expertise in human motion analysis and innovative inertial motion sensors makes Xsens a leader in inertial human motion capture solutions. **Contact:** Pantheon 6a // 7521 PR Enschede, NL // Ph: +31 88 9736700 // Fax : +31 88 9736701 // Email : info@xsens.com // www.xsens.com

Conference Schedule

Sunday June 21

Registration desk opens at 10,00

- 14,00 – 16,00 *ISPGR Board Meeting at Palazzo Re Enzo* [Meeting room floor I]
17,00 **Opening Address** [Salone del Podestà]
17,30 - 18,30 **Invited Lecture: "Modeling and Analysis of Human Behavior from Robotics",
prof. Yoshi Nakamura, Department of Mechano-Informatics, University of Tokyo, JAPAN**
18,30 - 20,00 *Welcome Reception* [Salone del Podestà]
21,00 - 22,00 *Special Event at Aula Magna Santa Lucia* [Via Castiglione 36]

Monday June 22

Registration desk opens at 8,00

- 9,00 - 10,00 **Invited Lecture: "Variability and coordination in posture and locomotion across
the life-span", prof. Karl M. Newell, Department of Kinesiology, The Pennsylvania State
University, University Park, USA** [Salone del Podestà]
10,00 – 10,30 *Coffee-Break*

10,30 – 12,30 ORAL SESSION I

SENSORY, MOTOR AND INTEGRATIVE CONTROL MECHANISMS [Salone del Podestà]
Moderators: *Manuel Hulliger, Brian Day* [10.30 – 12.30]

O.1-Which ankle muscle is the best proprioceptor during human upright standing?

*Irene Di Giulio¹, Constantinos N. Maganaris¹, Vasilios Baltzopoulos¹, Ian D. Loram¹, ¹MMU,
Manchester, United Kingdom*

O.2-Plantar sensory degradation on motion perception and postural control

Yongwoo Yi¹, Sukyung Park¹, ¹KAIST, Daejeon, Republic of Korea

O.3-Investigating sensory interaction of cutaneous and vestibular systems during stance

Andrew Woolnough¹, Leah Bent¹, ¹University of Guelph, Guelph, Canada

O.4-Evidence for the contribution of sensory integration mechanisms to spinal stabilization

*Adam Goodworth¹, Robert Peterka¹, ¹Oregon Health & Science University, Beaverton, OR, United
States*

O.5-Habituation of postural response to Galvanic vestibular stimulation

*Valentina Dilda¹, Hamish MacDougall², Steven Moore¹, ¹Mt Sinai School of Medicine, New York NY,
United States, ²University of Sydney, Sydney NSW, Australia*

O.6-Auditory startle reveals possible brainstem involvement in triggering postural responses

*Adam Campbell¹, Justin Davis¹, Mark Carpenter¹, ¹School of Human Kinetics, University of British
Columbia, Vancouver, British Columbia, Canada*

O.7-Effects of initial standing positions before transient floor translation on contingent negative variation of brain potential

*Katsuo Fujiwara¹, Kaoru Maeda², Hidehito Tomita³, Naoe Kiyota¹, Chie Yaguchi¹, ¹Kanazawa
University, Kanazawa, Ishikawa, Japan, ²Morinomiyama University of Health Sciences, Osaka, Japan,
³Toyohashi SOZO University, Toyohashi, Aichi, Japan*

O.8-Spatiotemporal organization of motoneuron activity in the human spinal cord during different gaits

*Yuri Ivanenko¹, Germana Cappellini¹, Richard Poppele², Francesco Lacquaniti^{1,3}, ¹IRCCS Fondazione
Santa Lucia, Rome, Italy, ²University of Minnesota, Minneapolis, United States, ³University of Rome
Tor Vergata, Rome, Italy*

ADVANCED ASSESSMENT TOOLS AND PROTOCOLS

Moderators: *Aurelio Cappozzo, Kamiar Aminian*

[Sala degli Atti]

[10,30 – 12,30]

K.1- Keynote lecture: Aurelio Cappozzo, Università degli Studi di Roma "Foro Italico", Rome, Italy

O.9-Markerless Sit to Stand analysis to predict SPPB scores in elderly people

Michela Goffredo¹, Maurizio Schmid¹, Silvia Conforto¹, Luisa Lopez², Tommaso D'Alessio¹, ¹Dept Applied Electronics University Roma Tre, Rome, Italy, ²Dept Neuroscience University Tor Vergata, Rome, Italy

O.10-3D Gait Analysis using wearable 6D IMU on shoe

Benoit Mariani¹, Kamiar Aminian¹, ¹EPFL, Laboratory of Movement Analysis and Measurement, Lausanne, Switzerland

O.11-Automated biofeedback assistance for freezing of gait in patients with Parkinson's disease

Meir Plotnik^{1,2}, Marc Bächlin³, Inbal Meidan¹, Daniel Roggen³, Gerhard Tröster³, Nir Giladi^{1,4}, Jeffrey M Hausdorff^{1,4}, ¹Tel Aviv Sourasky Medical Center, Tel Aviv, Israel, ²Bar Ilan University, Ramat Gan, Israel, ³Swiss Federal Institute of Technology, Zurich, Switzerland, ⁴Tel Aviv University, Tel Aviv, Israel, ⁵Harvard Medical School, Boston, United States

O.12-Differentiating malingering patients from healthy controls, unilateral vestibular loss patients and whiplash patients

John HJ Allum¹, Jaap Vonk¹, Corinne GC Horlings¹, ¹University Hospital Basel, Basel, Switzerland

O.13-Differentiation of young and older adult stair climbing gait using principal component analysis

Samantha Reid¹, Ryan Graham¹, Patrick Costigan¹, ¹Queen's University, Kingston, ON, Canada

O.14-Validation of a new instrumented ramp to assess ambulation while ascending and descending a slope.

Fany Chedevergne¹, Pierre Desjardins¹, Sylvie Nadeau¹, Rachid Aissaoui², ¹Center for Interdisciplinary Research in Rehabilitation of Greater Montreal, Gingras Lindsay Rehabilitation Institut of Montreal, Pathokinesiology Laboratory, Faculty of Rehabilitation of the Universi, Montreal, Qc, Canada, ²Center for Interdisciplinary Research in Rehabilitation of Greater Montreal, Highest Technology School, Imagery and Orthopedics Research Laboratory, Quebec University, Montreal, Qc, Canada

O.15-Portable system for the linear and non-linear re-calibration of force platforms

Andrea Cedraro¹, Fabio Bagalà¹, Lorenzo Chiari¹, Angelo Cappello¹, ¹University of Bologna, Bologna, Italy

12,30 – 14,00 Lunch

13,00 – 14,00 SPONSORED LUNCH WORKSHOP:: Healthcare technologies for an ageing population: major outcomes of the SENSATION-AAL project

[Sala degli Atti]

13,00 Introduction - the SENSATION-AAL experience (Lorenzo Chiari)

13,05 The first and the final - the user in the loop (Clemens Becker)

13,20 The technology meets the users' needs (Luca Benini)

13,35 Experimental evidence from a multicenter clinical study (Anat Mirelman)

13,50 Far and beyond: bequest of a project (Rob van Lummel, Laura Vanzago)

14,00 - 15,30 POSTER SESSION 1 (ODD NUMBERED POSTERS P.1 TO P.191)

15,30 – 16,00 Coffee-Break

16,00 - 17,00 YES/NO DEBATES

[Salone del Podestà]

Moderator: *John Allum*

D.1- "Does the equilibrium-point hypothesis help understand postural synergies?"

Discussants: Mark Latash & Yuri Ivanenko

D.2- "Preferring preferred speed?"

Discussants: Jacques Duysens & Bastian Bloem

17,00 – 18,00 ORAL SESSION II

LEARNING, PLASTICITY AND COMPENSATION

Moderators: *Mark Latash, Joyce Fung*

[Salone del Podestà]

[17,00 – 18,00]

O.16-The development of adaptation: How infants and adults modify their walking steps

Beatrix Vereijken¹, Karen Adolph², Simone Gill², ¹*Norwegian University of Science and Technology, Trondheim, Norway*, ²*New York University, New York, United States*

O.17-Visual control of rapid limb movements evoked by unpredictable postural perturbation

Brian Maki^{1,2}, Kenneth Cheng^{1,2}, Emily King^{1,2}, Tracy Lee¹, Sandra McKay^{1,2}, Amy Peters¹, Carol Scovill¹, John Zettel³, ¹*Sunnybrook Health Sciences Centre, Toronto, Canada*, ²*University of Toronto, Toronto, Canada*, ³*University of Guelph, Guelph, Canada*

O.18-Learning postural adjustments as a skill in the context of a volitional task: evidence for a memory consolidation phase.

Orit Elion^{1,2}, Yotam Bahat¹, Itamar Sela², Itzhack Siev-Ner¹, Patrice (Tamar) Weiss², Avi Karni^{1,2}, ¹*The C Sheba Medical Centre, Ramat Gan, Israel*, ²*Haifa University, Haifa, Israel*

O.19-Impact of cognition on motor control and adaptation to a novel slip induced in walking

Tanvi Bhatt¹, Yi-Chung Pai¹, ¹*University of Illinois at Chicago, Physical Therapy Dept., Chicago, IL, United States*

MODELLING AND BIOMECHANICS

Moderators: *Angelo Cappello, John Jeka*

[Sala degli Atti]

[17,00 – 18,00]

O.20-Analysis of power exertion for lifting the CoM during mobility related activities in daily life

Wiebren Zijlstra¹, Rob Bisseling¹, Stephan Schlumbohm², Heribert Balduš², ¹*University of Groningen, Groningen, Netherlands*, ²*Philips Research, Eindhoven, Netherlands*

O.21-Active stiffness and damping increase with age in postural control

Massimo Cenciari¹, Patrick J. Loughlin^{1,2}, Patrick J. Sparto^{1,4}, Mark S. Redfern^{1,3}, ¹*Bioengineering Dept., University of Pittsburgh, Pittsburgh, PA, United States*, ²*Electrical and Computer Engineering Dept., University of Pittsburgh, Pittsburgh, PA, United States*, ³*Otolaryngology Dept., University of Pittsburgh, Pittsburgh, PA, United States*, ⁴*Physical Therapy Dept., University of Pittsburgh, Pittsburgh, PA, United States*

O.22-What is the feedback time-delay and extent of linear time-invariant control when subjects manually control stable and unstable loads?

Ian Loram¹, Martin Lakie², Peter Gawthrop³, ¹*Manchester Metropolitan University, Manchester, United Kingdom*, ²*University of Birmingham, Birmingham, United Kingdom*, ³*University of Glasgow, Glasgow, United Kingdom*

O.23-The effect of long distance walking on plantar pressure distribution

Niki Stolwijk¹, Jaak Duysens^{1,2}, Noël Keijsers¹, ¹*St Maartenskliniek Research, Development & Education, Nijmegen, Netherlands*, ²*Department of Biomedical Kinesiology, Katholieke Universiteit Leuven, Leuven, Belgium*

Tuesday June 23

Registration desk opens at 8,00

9,00 - 10,30 POSTER SESSION 1 (EVEN NUMBERED POSTERS P.2 TO P.192)

10,30 – 11,00 Coffee-Break

11,00 – 13,00 ORAL SESSION III

COGNITIVE, ATTENTIONAL, AND EMOTIONAL INFLUENCES

Moderators: *Jim Frank, Anne Shumway-Cook*

[Salone del Podestà]

[11,00 – 13,00]

K.2- Keynote lecture: Jim Frank, *University of Windsor, Windsor, Ontario, Canada*

O.24-Effects of concurrent spatial and categorical cognitive tasks on the performance of a continuous postural alignment task.

Suvabrata Mitra¹, Hayley Boulton¹, ¹*University of Warwick, Coventry, United Kingdom*

O.25-Nature of the kinematic cues underlying the perception of emotions during human gait

Hideki Kadone¹, Halim Hicheur², Alain Berthoz¹, ¹LPPA, College de France, Paris, France, ²Hertie institute, University Clinic Tuebingen, Tuebingen, Germany

O.26-Cognitive and motor mechanisms underlying ability to divide attention while walking

Courtney Hall^{1,2}, Katharina Echt^{1,2}, Steve Wolf^{1,2}, Wendy Rogers³, ¹Atlanta VAMC, Decatur, GA, United States, ²Emory University, Atlanta, GA, United States, ³Georgia Institute of Technology, Atlanta, GA, United States

O.27-Evidence for a relationship between anxiety, visual sampling behaviour and falls risk in older adults performing adaptive locomotor tasks

William Young¹, Alan Wing¹, Mark Hollands¹, ¹University of Birmingham, Birmingham, United Kingdom, ²Queen's University Belfast, Belfast, United Kingdom

O.28-Effects of instructed prioritization and task difficulty on concurrent walking and cognitive task performance in healthy young adults

Valerie Kelly¹, Anne Shumway-Cook¹, ¹University of Washington, Seattle, WA, United States

O.29-Chronic stroke patients use a posture first strategy when avoiding obstacles under dual task conditions

Katrijn Smulders^{1,2}, Roos van Swigchem¹, Alexander C. Geurts^{1,3}, Vivian Weerdesteijn^{1,3}, ¹Radboud University Medical Center, Department of Rehabilitation, Nijmegen, Netherlands, ²HAN University of Applied Sciences, Institute of Sport and Exercise, Nijmegen, Netherlands, ³Sint Maartenskliniek, Research, Development and Education, Nijmegen, Netherlands

O.30-Task switching during dual task gait training is difficult for people with Parkinson Disease

Sandra Brauer¹, Meg Morris², Marjorie Woollacott³, Robyn Lamont¹, ¹The University of Queensland, Brisbane, Qld, Australia, ²The University of Melbourne, Carlton, Vic, Australia, ³The University of Oregon, Eugene, OR, United States

DEVELOPMENT OF POSTURE AND GAIT

Moderators: *Francesco Lacquaniti, Zoi Kapoula*

[Sala degli Atti]

[11,00 – 13,00]

K.3- Keynote lecture: Francesco Lacquaniti, IRCCS Fondazione Santa Lucia & University of Rome Tor Vergata, Rome, Italy

O.31- Development of spinal postural control: evidence of a four stage process.

Sandra Saavedra¹, Marjorie Woollacott¹, ¹University of Oregon, Eugene, Oregon, United States

O.32- Specific characteristics of balancing in children 7-11. Pivotal foot. Motor foot

Pascal Bourgeois¹, Maurice Ouaknine¹, ¹ILEPS, Cergy Pontoise Val d'Oise, France

O.33- The influence of body mass and physical activity on postural stability in children

Franciska Ulmer¹, Andrew Smith², ¹The University of Auckland, Auckland, New Zealand, ²The Hong Kong Institute of Education, Tai Po, New Territories, Hong Kong (TBC)

O.34- Normal postural performances in dyslexic teenagers during stroop or counting dual tasks

Zoi Kapoula¹, Eric Matheron¹, Maria-pia Bucci¹, ¹Laboratoire IRIS, Physiopathologie de la Vision et Motricité Binoculaire, FRE3154, CNRS, Paris, France

O.35- Limb kinematics and walking distance estimation after changing limb segment proportions. Evidence of a locomotor body schema.

Nadia Dominici^{1,2}, Elena Daprati^{1,2}, Daniele Nico^{1,3}, Germana Cappellini¹, Yuri Ivanenko¹, Francesco Lacquaniti^{1,2}, ¹IRCCS Fondazione Santa Lucia, Rome, Italy, ²University of Rome Tor Vergata, Rome, Italy, ³University of Rome "La Sapienza", Rome, Italy

O.36- Gender differences in the control of head accelerations during walking in children

Claudia Mazzà¹, Antonino Filocamo¹, Aurelio Cappozzo¹, ¹Università degli Studi di Roma "Foro Italico", Rome, Italy

O.37- Treadmill training and gait patterns in infants at moderate risk for neuromotor disabilities

Rosa Angulo-Barroso¹, Li-Chiou Chen^{1,2}, Chad Tiernan¹, Julia Looper¹, Dale Ulrich¹, ¹University of Michigan, Ann Arbor, MI, United States, ²Department of Physical Therapy, Taipei, Taiwan

13,00 – 14,00 Lunch

13,00 – 15,00 *Members' Meeting*

[Sala degli Atti]

15,00 – 21,00 *Free Afternoon – Social Activities*

Wednesday June 24

Registration desk opens at 8,00

9,00 - 10,00 Invited Lecture: "Posture control modelling with focus on the coordination of postural stabilization and focal movements of the upper limb", prof. Pietro G. Morasso, Neurolab, DIST, University of Genova, ITALY

[Salone del Podestà]

10,00 – 10,30 *Coffee-Break*

10,30 – 12,30 ORAL SESSION IV

STROKE

[Sala degli Atti]

Moderators: *Rolf Moe-Nilssen, Brad McFadyen*

[10,30 – 12,30]

O.38-Quantitative measures of sitting balance relate to measures of standing balance in individuals post-stroke.

Avril Mansfield^{1,2}, Cynthia Danells^{1,2}, Valerie Closson^{1,2}, Lisa Alexander^{1,2}, Stephanie Beadle^{1,5}, Ellen Cohen^{1,6}, Sandra Black^{2,4}, William McIlroy^{3,7}, ¹Heart and Stroke Foundation Centre for Stroke Recovery, Ontario, Canada, ²Sunnybrook Health Sciences Centre, Toronto, Ontario, Canada, ³Toronto Rehabilitation Institute, Toronto, Ontario, Canada, ⁴University of Toronto, Toronto, Ontario, Canada, ⁵Grand River Hospital, Kitchener, Ontario, Canada, ⁶Baycrest, Toronto, Ontario, Canada, ⁷University of Waterloo, Waterloo, Ontario, Canada

O.39-Abnormal coactivation of knee and ankle extensors is related to transmission changes in spinal pathways and clinical scores of motor function in chronic hemiparesis after stroke

Joseph-Omer Dyer^{1,2}, Éric Maupas^{3,4}, Sibebe de Andrade Melo^{1,2}, Daniel Bourbonnais^{1,2}, Robert Forget^{1,2}, ¹Centre de recherche interdisciplinaire en réadaptation de Montréal (CRIR), Montreal, Québec, Canada, ²École de réadaptation, Faculté de Médecine, Université de Montréal, Montréal, Québec, Canada, ³Centre Mutualiste de Rééducation Fonctionnelle, Albi, France, ⁴Université Paul Sabatier, Toulouse III, Toulouse, France

O.40-An exploratory analysis of spatial and temporal characteristics of intersegmental head and shoulder rotation in people early after stroke

Geert Verheyden¹, Janet Littlewood¹, Malcolm Burnett¹, Denise Taylor², Neil Shepard³, Ann Ashburn¹, ¹University of Southampton, Southampton, United Kingdom, ²Auckland University of Technology, Auckland, New Zealand, ³Mayo Clinic, Rochester, United States

O.41-Postural behaviors to combined visual and base of support pitch disturbance in healthy adults and patients post-stroke.

Emily Keshner¹, Jill Slaboda¹, ¹Temple University, Philadelphia, PA, United States

O.42-The effect of additional hand contact on postural stability perturbed by moving environment in patients after stroke

Emily van de Water¹, Ksenia Ustinova¹, ¹Central Michigan University, Mount Pleasant, MI, United States

O.43-Visually-triggered step adjustments are substantially impaired in mildly affected stroke subjects

Vivian Weerdesteyn^{1,2}, Jorik Nonnekes^{1,3}, Penelope Talelli³, Mark De Niet¹, Raymond Reynolds⁴, Brian Day³, ¹Radboud University Nijmegen Medical Centre, Department of Rehabilitation, Nijmegen, Netherlands, ²Sint Maartenskliniek Research, Development & Education, Nijmegen, Netherlands, ³Sobell Department of Motor Neuroscience and Movement Disorders, UCL Institute of Neurology, London, United Kingdom, ⁴School of Sports and Exercise Science, University of Birmingham, Birmingham, United Kingdom

O.44-Change in gait variables during modulation of speed in patients post-stroke and healthy subjects

Mona Kristin Aaslund¹, Rolf Moe-Nilssen¹, ¹University of Bergen, Bergen, Norway

O.45-Kinematics of turning during the Timed Up and Go in chronic stroke survivors with and without a falls history

Kristen Hollands¹, Paulette Van Vliet², Alan Wing¹, Doerte Zietz¹, Mark Hollands¹, ¹ *University of Birmingham, Birmingham, United Kingdom*, ² *University of Nottingham, Nottingham, United Kingdom*

COORDINATION OF POSTURE AND MOVEMENT

Moderators: *Marco Schieppati, Mark Redfern*

[Salone del Podestà]
[10,30 – 12,30]

K.4- Keynote lecture: Marco Schieppati, Department of Experimental Medicine, University of Pavia and IRCCS Fondazione Salvatore Maugeri, Pavia, Italy

O.46-Factors affecting body balance control during interpersonal light touch

Leif Johannsen¹, Alan Wing¹, Vassilia Hatzitaki², ¹ *University of Birmingham, Birmingham, West Midlands, United Kingdom*, ² *Aristotle University of Thessaloniki, Thessaloniki, Greece*

O.47-Trunk activity in human, from posture to locomotion.

Jean-Charles Ceccato^{1,2}, Mathieu De Sèze^{3,4}, Christine Azevedo², Jean-René Cazalets¹, ¹ *Univesité de Bordeaux; CNRS UMR 5227, Bordeaux, France*, ² *INRIA/LIRMM; DEMAR, Montpellier, France*, ³ *CHU Pellegrin, service MPR, Bordeaux, France*, ⁴ *Université d Bordeaux 2, EA 4136, Bordeaux, France*

O.48-On the relationship between body orientation and direction of motion during human locomotion.

Tan Viet Anh Truong^{1,2}, Katja Mombaur^{1,2}, Jean-Paul Laumond^{1,2}, ¹ *CNRS; LAAS; 7 avenue du colonel Roche, F-31077, Toulouse, France*, ² *Université de Toulouse; UPS, INSA, INP, ISAE; LAAS; F-31077, Toulouse, France*

O.49-How vision influences postural stability during locomotion

John Jeka¹, David Logan¹, Yuri Ivanenko², Tim Kiemel¹, Nadia Dominici², Germana Cappellini², Francesco Lacquaniti², ¹ *University of Maryland, College Park, MD, United States*, ² *Santa Lucia Foundation, Rome, Italy*

O.50-Eyes or head: Which has the greatest effect on steering control?

Michael E. Cinelli^{1,2}, William H. Warren², ¹ *Wilfrid Laurier University, Waterloo, ON, Canada*, ² *Brown University, Providence, RI, United States*

O.51-Coordination of turning while walking in individuals with Parkinson's disease "off" and "on" medication

Sakineh Akram¹, Jim Frank², Julia Fraser¹, Mandar Jog³, ¹ *University of Waterloo, Waterloo, Ontario, Canada*, ² *University of Windsor, Windsor, Ontario, Canada*, ³ *London Health Sciences Centre, London, Ontario, Canada*

O.52-Foot cutaneous stimulation during motor preparation enhances posture and locomotion components of step initiation in people with parkinson's disease

Mark Rogers², Prem Batchu¹, Lindsay Cahill¹, Kathy Martinez¹, Ashley Pezza¹, Andrea Remick¹, Colum MacKinnon¹, ¹ *Northwestern University, Chicago, IL, United States*, ² *University of Maryland, Baltimore, MD, United States*

12,30 – 14,00 Lunch

14,00 - 15,30 POSTER SESSION 2 (ODD NUMBERED POSTERS P.193 TO P.383)

15,30 – 16,00 Coffee-Break

16,00 – 18,00 ORAL SESSION V

FALLS AND FALL PREVENTION

Moderators: *Clemens Becker, Clive Pai*

[Salone del Podestà]
[16,00 – 18,00]

K.5- Keynote lecture: Clemens Becker, Robert-Bosch-Hospital, Stuttgart, Germany

O.53-Video recording of real-life falls in long term care provides new insight on the cause and circumstances of falls in older adults.

Stephen Robinovitch¹, Fabio Feldman^{1,2}, Darwin Wan¹, Omar Aziz¹, Thiago Sarraf¹, ¹ *Simon Fraser University, Vancouver, Canada*, ² *Fraser Health Authority, British Columbia, Canada*

O.54-Determinants of disparities between perceived and actual fall risk in older people

Kim Delbaere^{1,2}, Stephen Lord¹, Jacqueline Close¹, ¹Prince of Wales Medical Research Institute, Randwick, NSW, Australia, ²Ghent University, Ghent, Belgium

O.55-Force-thresholds for stepping in young and older adults

Daina Sturnieks¹, Mirjam Pijnappels², Jasmine Menant¹, Stephen Lord¹, Mark Rogers³, Richard Fitzpatrick¹, ¹Prince of Wales Medical Research Institute, Sydney, Australia, ²Vrije Universiteit, Amsterdam, Netherlands, ³University of Maryland, Baltimore, United States

O.56-Recurrent Falls and Dual-task Related Decrease in Walking Speed: Is There a Relationship?

Cedric Annweiler¹, Gilles Allali², Veronique Dubost³, Francois Herrmann³, Olivier Beauchet¹, ¹Angers University Hospital, ANGERS, France, ²Geneva University Hospital, GENEVA, Switzerland, ³KORIAN, PARIS, France

O.57-Predictors of recurrent falling in healthy older adults: the importance of both executive function and gait

Talia Herman¹, Anat Mirelman^{1,4}, Marina Brozgol¹, Inbal Maidan¹, Avinoam Jacobs¹, Nir Giladi², Jeffrey Hausdorff^{1,3}, ¹Laboratory for Gait and Neurodynamics, Tel Aviv Sourasky Medical Center, Tel Aviv, Israel, ²Dept of Neurology, Sackler School of Medicine, Tel-Aviv University, Israel, ³Dept of Physical Therapy, Tel-Aviv University, Israel, ⁴Harvard Medical School, MA, United States

O.58-Fall risk: prediction and prevention. Balance impairments in indian subjects.

Nandu Chhabria¹, Poonam Bajaj¹, ¹Sir Hurkisondas Nurrotumdas Hospital & Research Center, Physiotherapy, Mumbai, India

O.59-Avoid alcohol, avoid falling?

Judith Hegeman^{1,2}, Vivian Weerdesteyn^{1,3}, Bart van den Bemt⁴, Bart Nienhuis¹, Jacques van Limbeek¹, Jacques Duysens^{1,5}, ¹Department of Research, Development & Education, St. Maartenskliniek, Nijmegen, Netherlands, ²Institute for Fundamental and Clinical Human Movement Sciences (IFKB), Amsterdam, Netherlands, ³Department of Rehabilitation, University Medical Centre St. Radboud, Nijmegen, Netherlands, ⁴Department of Pharmacy, St. Maartenskliniek, Nijmegen, Netherlands, ⁵Department of Biomedical Kinesiology, (FaBeR) K.U., Leuven, Belgium

CEREBRAL PALSY

Moderators: Marjorie Woollacott, Alexander Geurts

[Sala degli Atti]

[16,00 – 17,00]

O.60-Perception-action integration strategies for visually-guided locomotion in healthy vs. spastic diplegic children, as revealed by kinematic data and trajectory analysis

Vittorio Belmonti¹, Michele Coluccini^{2,3}, Silvia Perazza³, Giovanni Cioni^{2,3}, Alain Berthoz^{4,5}, ¹Dipartimento di Fisiologia Umana, Università di Pisa, Pisa, Italy, ²Dipartimento di Medicina della Procreazione e dell'Età Evolutiva, Università di Pisa, Pisa, Italy, ³IRCCS Stella Maris, Pisa, Italy, ⁴Laboratoire de Physiologie de la Perception et de l'Action, Collège de France, Paris, France, ⁵CNRS, Paris, France

O.61-Anticipatory postural control in the diplegic forms of cerebral palsy: influence of the perceptive impairment

Luca Tersi¹, Alberto Ferrari¹, Adriano Ferrari^{2,3}, Alice Sghedoni³, Lorenzo Chiari¹, ¹University of Bologna, Bologna, Italy, ²University of Modena e Reggio, Modena, Italy, ³ASMN Hospital, Reggio Emilia, Italy

O.62-Relationship of dynamic standing balance and functional and temporal-spatial measures of gait in children with and without cerebral palsy

James Moore¹, Rose Marie Rine², ¹University of Miami, Coral Gables, Florida, United States, ²University of North Florida, Jacksonville, Florida, United States

O.63-Physical activity patterns in children with cerebral palsy

Karin Sonderegger^{1,2}, Francisca Eugster Buesch^{1,3}, Roland Müller¹, Nicole Ruch², Andreas Meyer-Heim³, ¹ETH Zurich, Institute of Human Movement Sciences and Sport, Zurich, Switzerland, ²Swiss Federal Office of Sport, Institute of Sport Sciences, Magglingen, Switzerland, ³University Children's Hospital Zurich, Rehabilitation Centre, Affoltern, Switzerland

SPORT, EXERCISE AND ERGONOMICS

Moderators: *Alberto Leardini, Eling de Bruin*

[Sala degli Atti]

[17,00 – 18,00]

O.64-Bilateral deficit and EMG activity during explosive lower limb contractions with different overloads.

Enrico Rejc¹, Stefano Lazzer¹, Guglielmo Antonutto¹, Pietro di Prampero¹, ¹*University of Udine, Udine, Italy*

O.65-Spinal posture in sitting: How do we sit and how should we sit?

Andrew Claus¹, Julie Hides¹, Lorimer Moseley^{2,3}, Paul Hodges¹, ¹*The University of Queensland, NHMRC Centre of Clinical Research Excellence in Spinal Pain, Injury and Health, School of Health and Rehabilitation Sciences, Brisbane, Australia*, ²*University of Oxford, Department of Physiology, Anatomy & Genetics, Oxford, United Kingdom*, ³*Prince of Wales Medical Research Institute, Sydney, Australia*

O.66-3D surgeons postural analyses during standard and robotic laparoscopic procedures

Martine Gilles¹, Nicolas Hubert², Kevin Desbrosses¹, Jean Pierre Meyer¹, Jacques Felbinger³, Jacques Hubert², ¹*INRS, Vandoeuvre les Nancy, France*, ²*Urology dpt CHU Brabois, Vandoeuvre les Nancy, France*, ³*IADI-UHP Inserm, Vandoeuvre les Nancy, France*

O.67-The effects of a load on balance during lateral load transfers

Robert Catena^{1,2}, Angela DiDomenico², Jacob Banks², Jack Dennerlein¹, ¹*Harvard School of Public Health, Boston, MA, United States*, ²*Liberty Mutual Research Institute for Safety, Hopkinton, MA, United States*

20,00 – 23,00 *Social Dinner at Palazzo Isolani*

[Via Santo Stefano 16]

Thursday June 25

Registration desk opens at 8,00

9,00 - 10,00 Invited Lecture: "The real challenge for gait research is challenged gait", prof. Jacques Duysens, Dept. of Biomedical Kinesiology, Katholieke Universiteit Leuven, BELGIUM

[Salone del Podestà]

10,00 – 10,30 *Coffee-Break*

10,30 – 12,30 ORAL SESSION VI

BASAL GANGLIA DISORDERS

Moderators: *Jeff Hausdorff, Bastiaan Bloem*

[Sala degli Atti]

[10,30 – 12,30]

K.6- Keynote lecture: Jeff Hausdorff, Tel-Aviv Sourasky Medical Center & Harvard Medical School, Israel

O.68-Sway jerk is a good biomarker of early Parkinson's disease and its progression

Martina Mancini^{1,2}, Fay B Horak², Lorenzo Chiari¹, ¹*DEIS, University of Bologna, Bologna, Italy*, ²*Department of Neurology, OHSU, Beaverton, Oregon, United States*

O.69-Lower limb kinematics during obstacle crossing in people with Parkinson's disease

Brook Galna^{1,2}, Anna T Murphy^{1,2}, Meg E Morris¹, ¹*1. School of Physiotherapy, The University of Melbourne, Victoria, Australia*, ²*2. Clinical Research Centre for Movement Disorders and Gait, Kingston Aged Care and Rehabilitation Centre, Victoria, Australia*

O.70-Walking cadence and velocity is improved by rhythmic vibration of postural muscles in Parkinson's disease

Margherita Grasso¹, Alessandro Marco De Nunzio², Marco Godi¹, Antonio Nardone^{1,4}, Marco Schieppati^{2,3}, ¹*Posture and Movement Laboratory, Division of Physical Therapy and Rehabilitation, Scientific Institute of Veruno, Salvatore Maugeri Foundation (IRCCS), Veruno (NO), Italy*, ²*Centro Studi Attività Motorie, Scientific Institute of Pavia, Salvatore Maugeri Foundation (IRCCS), Pavia, Italy*, ³*Department of Experimental Medicine, University of Pavia, Pavia, Italy*, ⁴*Department of Clinical and Experimental Medicine, University of Eastern Piedmont, Novara, Italy*

O.71-Auditory cueing and obstacle avoidance in Parkinson's disease patients

Wandana Mahabier¹, Arnaud Delval², Sebastiaan Overeem¹, Vivian Weerdesteijn¹, Bastiaan Bloem¹,
¹Radboud University Medical Center, Nijmegen, Netherlands, ²Lille Regional University Hospital, Lille,
France

O.72-Autonomic Nervous System in Parkinson's disease: New evidence on the relationship to freezing of gait

Inbal Maidan¹, Anat Mirelman^{1,3}, Aner Weiss¹, Meir Plotnik¹, Noit Inbar¹, Nir Giladi^{1,2}, Jeffrey
Hausdorff^{1,2}, ¹Movement Disorders Unit, Dept of Neurology, Tel-Aviv Sourasky Medical Center, Tel
Aviv, Israel, ²Sackler Faculty of Medicine, Tel-Aviv University, Tel Aviv, Israel, ³Harvard Medical
School, Boston, MA, Boston MA, United States

O.73-Modulation of gait symmetry by subthalamic stimulation improves intractable freezing of gait

Alfonso Fasano¹, Henning Stolze², Jens Volkmann³, Gunther Deuschl³, Jan Herzog³, ¹Istituto di
Neurologia Università Cattolica del Sacro Cuore, Rome, Italy, ²Diakonissenanstalt Flensburg, Klinik für
Neurologie, Flensburg, Germany, ³Department of Neurology, Christian-Albrechts-University, Kiel,
Germany

O.74-Monoaminergic and cholinergic correlates of falling in Parkinson disease

Martijn Muller¹, Roger Albin^{1,2}, Robert Koeppe¹, Kirk Frey¹, Nico Bohnen^{1,2}, ¹University of Michigan,
Ann Arbor, MI, United States, ²VA Health System, Ann Arbor, MI, United States

GAIT AND POSTURE IN OLDER ADULTS

Moderators: *Stephen Lord, Wiebren Zijlstra*

[Salone del Podestà]

[10,30 – 11,30]

O.75-Sensory integration for stance control involves perceptual inhibition in older adults

Mark Redfern¹, J. Richard Jennings¹, ¹University of Pittsburgh, Pittsburgh, PA, United States

O.76-Evidence for a link between inappropriate compensatory pitch head movement and increased obstacle contacts in older people wearing multifocal glasses

Jasmine Menant¹, Rebecca St George¹, Blake Sandery¹, Richard Fitzpatrick¹, Stephen Lord¹, ¹Prince
of Wales Medical Research Institute, Randwick, New South Wales, Australia

O.77-Sensorimotor correlates of gait variability in older people. A population-based study

Michele Callisaya¹, Jennifer McGinley³, Leigh Blizzard¹, Michael Schmidt¹, Velandai Srikanth^{1,2},
¹Menzies Research Institute, Hobart, Tasmania, Australia, ²Monash Medical Centre, Melbourne,
Victoria, Australia, ³Murdoch Children's Research Institute, Melbourne, Victoria, Australia

O.78-The effects of footwear anterior/posterior stiffness on dynamic balance control in older adults

Stephen Perry^{1,2}, Kristen McFall¹, Craig Tschirhart¹, ¹Wilfrid Laurier University, Waterloo, Ontario,
Canada, ²Toronto Rehabilitation Institute, Toronto, Ontario, Canada

ACTIVITY MONITORING DURING DAILY LIVING

Moderators: *Hans Bussmann, Frantisek Hlavacka*

[Salone del Podestà]

[11,30 – 12,30]

O.79-Added value of activity monitoring in rehabilitation medicine

Hans Bussmann¹, Rita van den Berg-Emons¹, Henk Stam¹, ¹Dept. of Rehabilitation Medicine,
Erasmus MC University Medical Center, Rotterdam, Netherlands

O.80-Day-to-day variability of physical activity of older persons living in the community.

Simone Nicolai¹, Petra Benzinger¹, Dawn Skelton², Kamiar Aminian³, Clemens Becker¹, Ulrich
Lindemann¹, ¹Robert-Bosch-Hospital, Stuttgart, Germany, ²Glasgow Caledonian University, Glasgow,
United Kingdom, ³Ecole Polytechnique Fédérale de Lausanne, Lausanne, Switzerland

O.81-Activity level and functioning three months after a hip fracture

Kristin Taraldsen¹, Pernille Thingstad¹, Olav Sletvold^{1,2}, Jorunn Helbostad^{1,2}, ¹Department of
Neuroscience, Norwegian University of Technology and Science, Trondheim, Norway, ²Department of
Geriatrics, St. Olav University Hospital, Trondheim, Norway

O.82-Quantification of physical activity and behaviour change: developing a novel method for analysing objective measures of physical activity.

Sebastien Chastin¹, Malcolm Granat¹, Lynn Rochester², ¹Glasgow Caledonian University, Glasgow Scotland, United Kingdom, ²Newcastle University, Newcastle, United Kingdom

12,30 – 14,00 Lunch

14,00 - 15,30 POSTER SESSION 2 (EVEN NUMBERED POSTERS P.194 TO P.384)

15,30 – 16,00 Coffee-Break

16,00 – 18,00 ORAL SESSION VII

SENSORY TRAINING AND REHABILITATION

[Salone del Podestà]

Moderators: *Fay B. Horak, Sandra Brauer*

[16,00 – 18,00]

K.7- Keynote lecture: Fay B. Horak, Oregon Health and Science University, Portland, Oregon, United States

O.83- Development of a Clinical Balance Evaluation Systems test (BESTest) for Differentiating Balance Deficits

Fay Horak¹, James Frank¹, Diane Wrisley¹, Antonio Nardone^{2,3}, Marco Godi², Franco Franchignoni², ¹Oregon Health and Science University, Portland, Oregon, United States, ²Scientific Institute of Veruno, Salvatore Maugeri Foundation (IRCCS), Veruno (NO), Italy, ³Department of Clinical and Experimental Medicine, University of Eastern Piedmont, Novara, Italy

O.84- Effect of a physiotherapy treatment on the sagittal plane gait biomechanics of knee osteoarthritis patients: preliminary results

Nathaly Gaudreault^{1,2}, Katia Turcot³, Karine Boivin^{1,4}, Nicola Hagemester^{1,5}, Jacques A. deGuise^{1,5}, ¹Laboratoire de recherche en imagerie et orthopédie (LIO), Centre de recherche du Centre hospitalier de l'Université de Montréal, Montréal, Québec, Canada, ²École de réadaptation, Faculté de Médecine et de Sciences de la Santé de l'Université de Sherbrooke, Sherbrooke, Québec, Canada, ³Laboratoire de Cinésiologie Willy Taillard, Hôpitaux Universitaires de Genève, Genève, Switzerland, ⁴Département des Sciences de l'activité physique, Université de Trois-Rivières, Trois-Rivières, Québec, Canada, ⁵Département de génie de la production automatisée, École de technologie supérieure, Montréal, Québec, Canada

O.85-Approach for rehabilitation treatment of cerebellar patients presenting with postural ataxia

Dieter Kutz¹, Dagmar Timmann², Florian Kolb¹, ¹Institute of Physiology, Munich, Germany, ²Department of Neurology, Essen, Germany

O.86-Intensive coordinative training improves motor performance in degenerative cerebellar disease

Winfried Ilg¹, Matthis Synofzik², Doris Brötz⁴, Susanne Burkard³, Martin Giese¹, Ludger Schöls², ¹Hertie Institute of Clinical Brain Research, Dep. Cognitive Neurology, Tübingen, Germany, ²Hertie Institute of Clinical Brain Research, Dep. Neurodegeneration, Tübingen, Germany, ³University Clinic, Centre for Neurology, Therapy Centre, Tübingen, Germany, ⁴University Tübingen, Institute of medical Psychology and behavioral Neurobiology, Tübingen, Germany

O.87-Balance training with visual feedback can improve balance abilities in people with spinal cord injury

Dimitry Sayenko¹, Maria Alekhina², Albert Vette³, Kimitaka Nakazawa⁴, Milos Popovic^{1,3}, ¹Rehabilitation Engineering Laboratory, Toronto Rehabilitation Institute, Toronto, Ontario, Canada, ²Perceptual-Motor Behaviour Laboratory, Faculty of Physical Education and Health, University of Toronto, Toronto, Ontario, Canada, ³Institute of Biomaterials and Biomedical Engineering, University of Toronto, Toronto, Ontario, Canada, ⁴Department of Rehabilitation for Movement Functions, Research Institute of National Rehabilitation Center for Persons with Disabilities, Tokorozawa, Saitama, Japan

O.88-Circuit-based rehabilitation improves gait endurance but not usual walking activity in chronic stroke: a randomised clinical trial

Suzie Mudge¹, Alan Barber¹, Susan Stott¹, ¹University of Auckland, Auckland, New Zealand

O.89-Advances in vestibular rehabilitation: high-tech vs. low-tech optokinetic stimulation and the role of supervision

Marousa Pavlou¹, Adolfo Bronstein², Rosalyn Davies³, ¹King's College London, London, United Kingdom, ²Imperial College London, London, United Kingdom, ³National Hospital for Neurology and Neurosurgery, Queen Square, London, United Kingdom

VESTIBULAR PATHOPHYSIOLOGY

Moderators: *Kazuo Ishikawa, Liliane Borel*

[Sala degli Atti]

[16,00 – 17,00]

O.90-Visual vertigo and vestibulopathy: I. Balance functions and posturography findings

Oz Zur^{1,2}, Elizabeth Dannenbaum², Ruthy Dickstein¹, Joyce Fung^{2,3}, ¹*University of Haifa, Haifa, Mt Carmel, Israel*, ²*Feil & Oberfeld /CRIR Research Center Jewish Rehabilitation Hospital, Laval, Quebec, Canada*, ³*School of Physical and Occupational Therapy McGill University, Montreal, Quebec, Canada*

O.91-The relationship between positional vertigo and visual dependency

Kiran Agarwal¹, Adolfo Bronstein¹, Mary Faldon¹, Marco Mandala^{2,1}, Yvonne Silove¹, ¹*Neuro-otology Unit, Imperial College London, London, United Kingdom*, ²*University Department of ORL, Siena, Italy*

O.92-Classification of idiopathic bilateral vestibulopathy and relations of the subtypes to stabilometric findings

Toshihisa Murofushi¹, Chisato Fujimoto², Munetaka Ushio², Masaki Matsuzaki³, ¹*Teikyo University Mizonokuchi Hospital, Kawasaki, Japan*, ²*Tokyo University, Tokyo, Japan*, ³*Toshiba Hospital, Tokyo, Japan*

O.93-Gait phase instability in cases with small acoustic neuroma: analysis by the use of tactile sensor

Kazuo Ishikawa¹, Min Yin¹, Weng Hoe Wong¹, Takashi Saitoh¹, Yutaka Shibata¹, ¹*Akita University School of Medicine, Akita, Japan*

ORTHOPEDIC DISEASES AND TREATMENT

Moderators: *Sharon Henry, Carlo Frigo*

[Sala degli Atti]

[17,00 – 18,00]

O.94-Trunk postural control in subjects with low-back pain or a recent history of low-back pain

Jaap van Dieen¹, Lando Koppes², Jos Twisk², ¹*Research Institute MOVE, Faculty of Human Movement Sciences, VU University Amsterdam, Amsterdam, Netherlands*, ²*EMGO Institute, VU University Medical Center, Amsterdam, Netherlands*

O.95-Outcome evaluation of ankle osteoarthritis treatments using spatio-temporal gait parameters and plantar pressure during unconstrained long distance walking

Hossein Rouhani¹, Julien Favre¹, Xavier Crevoisier², Brigitte M Jolles^{1,2}, Omid Zobeiri¹, Kamiar Aminian¹, ¹*EPFL, Laboratory of Movement Analysis and Measurement, Lausanne, Switzerland*, ²*CHUV, Département de l'Appareil Locomoteur, Lausanne, Switzerland*

O.96-Relationship between physical function and stiffened pattern of movement during gait in patients with knee osteoarthritis

Alexandra Gil¹, Patrick Sparto¹, April Chambers¹, Rakie Cham¹, G. Kelley Fitzgerald¹, ¹*University of Pittsburgh, Pittsburgh, PA, United States*

O.97-Kinematics of the three components of a novel ligament-compatible total ankle prosthesis: in-vivo fluoroscopic analysis at three consecutive follow-ups

Francesco Cenni¹, Sandro Giannini¹, Matteo Romagnoli¹, Teresa Sforza¹, Claudio Belvedere¹, Alberto Leardini¹, ¹*Istituto Ortopedico Rizzoli, Bologna, Italy*

18,00 – 19,00 Closing Reception

Conference Social Activities



Discover Bologna: Walking Tour

- Monday, June 22, 2009
Duration: 3 hours (9.30am-12.30pm)
- Tickets: \$40/each
- Free for registered accompanying persons. Meeting point with the English speaking guide and begin the sightseeing tour of the famous historical centre, Europe's second largest after Venice and containing a wealth of important Medieval, Renaissance and Baroque artistic monuments. In the past, the original Roman ramparts were supplanted by a high medieval system of fortifications, remains of which are today still visible. Over twenty medieval defensive towers remain from the over 200 that were constructed in the medieval period. The city landscape is further enriched by elegant and extensive arcades or porticos, that assure covered passages for over 38 km. in the city centre. The University of Bologna, founded in 1088, is the oldest University in Europe and is still nowadays an important centre of intellectual life and one of the most respected and dynamic post-secondary educational institutions in Italy. Visitors can admire the main square "Piazza Maggiore", the heart of the town, which is the result of secular changes when important buildings and monuments enriched the Piazza: "Fontana del Nettuno", "Palazzo Re Enzo", "Basilica San Petronio. The visit include the "Basilica di Santo Stefano with sanctuary": a group of churches locally known as Sette Chiese ("Seven Churches") and called "Holy Jerusalem" as it recalls the passion of Jesus.

Bologna: Treasure Hunt

- Monday, June 22, 2009
Duration: 2,5 hours (6.00pm-8.30pm)
- Tickets: \$35/each
- The participants will take a leisurely treasure hunt in the old city of Bologna to discover in a funny, original way the city, its history, and its inhabitants...



The Hills of Bologna: Hiking

- Tuesday, June 23, 2009
Duration: 5 hours (3.00pm-8.00pm)
Limited Enrollment: max 54
- Tickets: \$70/each
- Hiking through grapes and abbeys in the hills around Bologna. Price per person includes bus transfer + country snack + guide.



Cooking Lesson

- Tuesday, June 23, 2009
Duration: 5 hours (5.00pm-10pm)
Limited Enrollment: max 20
- Thursday, June 25, 2009
Duration: 5 hours (10.00am-3.00pm)
Limited Enrollment: max 20
- Tickets: \$150/each
- In the morning/afternoon, meeting point with the guide and transfer to a typical farmhouse for the "real pasta course": a journey through the world of taste and the traditions of a city known for its millenary food culture. Arrival and welcome coffee break. Three hours of laboratory lesson, with hands-on of all person o to learn how to prepare Tortellini, Tortelloni and Tagliatelle. At the end of the course the lunch/dinner based on local dishes will be organized at the farm house. Return to Bologna in the early afternoon/evening. Price per person includes bus transfer + lunch/dinner + lesson.



Ravenna: The Mosaic City

- Tuesday, June 23, 2009
Duration: 7 hours (3.00pm-10pm)
Limited Enrollment: max 54
- Tickets: \$150/each
- Departure from Bologna by bus to Ravenna and visit to its main monuments and famous Byzantine mosaics: Mausoleo di Galla Placidia, Basilica di Sant'Apollinare Nuovo, San Vitale, Sepolcro di Dante, Chiesa di San Francesco, Basilica di San Giovanni Evangelista, Palazzo di Teodorico e Mausoleo. Dinner in a typical "osteria". Return to Bologna in the evening. Price per person includes bus transfer + dinner + guided visits.



Ferrari Museum and Balsamic Traditional Vinegar Producer Visit

- Tuesday, June 23, 2009
Duration: 6 hours (4pm – 10 pm)
Limited Enrollment: max 54
- Tickets: \$130/each
- In the afternoon Participants pick- up (face Palazzo Re Enzo – Bologna) and departure of the tour. Visit to “Galleria Ferrari” in Maranello, the official exhibition of the most famous sports car in the world. In the exhibition you can see the best standard-model and racing cars produced in each era of the “Cavallino” racing team, and relive the illustrious history of the racing team created by Enzo Ferrari. Guided visit to a Modena’s traditional balsamic vinegar private producer. Explanation of history and production method and final tasting of all the different aged vinegars produced by the owner. Light dinner after the visit. Price per person includes bus transfer + dinner + guided visits.

Food and Wine Itinerary



- Wednesday, June 24, 2009
Duration: 8 hours (9:30 am-5:30 pm) Limited Enrollment: max 54
- Tickets: \$170/each
- In the Morning Participants pick- up (face Palazzo Re Enzo – Bologna) and departure of the tour: Parmigiano Reggiano dairy visit - Guided tour in a dairy where milk is transformed in order to produce the well-known Parmigiano Reggiano, the king of the culinary tradition of Emilia and one of the most famous Italian gastronomy products in the world: the milk cooking, the cheese shaping, the seasoning hall. Includes tasting of Parmigiano and the opportunity of buying products directly in the factory shop. Lunch in typical restaurant or farm restaurant belonging to “Strada dei Vini e dei Sapori” (road of wines and flavours) , discovering Emilia-Romagna’s cooking traditions. In the afternoon visit to traditional Modena’s Balsamic Vinegar Museum. The museum was founded with the aim of preserving and spreading the culture of Balsamic vinegar, and to create a place where its values can be conveyed. Strolling amidst the barrels that contain the “black gold”, the history of the product will be explained, as well as the traditional and unique method for obtaining this delight to the palate, starting with the cooked must of Trebbiano and Lambrusco grapes. Includes tasting At the end visit to wine producer In “Colli Bolognesi” D.O.C. area, visit to a wine producer. Visit of grapevines and the cellars and display of the wine production process. Includes tasting of different wines served with local typical products. Price per person includes bus transfer + lunch + guided visits.



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