International Society of Biomechanics Newsletter

ISSUE Number 99
April, 2006

TABLE OF CONTENTS

Note from the President

The "Special Issue" newsletter that focused on Africa resulted in a number of follow-up email messages. One was written by a student who said, "I saw somebody who actually used the words ***biomechanics*** and ***Africa*** in the same phrase for the first time and immediately wanted to learn more". Another simply said, "Way to go!" A third suggested that there was, in fact, a long way to go! The writer stated, "From my own thinking, it may be that poor cooperation of my school with other organizations can be explained by the problem of the communication language, since Togo is French speaking country….I hope in the future it will be easy for me to try to looking for more Societies who will like to cooperate with the School of Togo.

While the issues of language barriers, access to technology and limited research opportunities will continue to be problem areas in Africa, I do not want to focus solely on these for the time that I serve the ISB as president. With this in mind, I contacted all those individuals from **South America** who attended ISB2005, and I invited them to contribute to this newsletter. A number responded---including Marco Aurélio Vaz who offered to write an obituary for Tony Guimaraes. Back when I was newsletter editor in 2003, I had interviewed Tony (Issue #87, April 2003). One of the questions I asked him was, "What accomplishments are you especially proud of? He answered, "I believe that my main contribution to the development of biomechanics in Brazil was to have organized, along with other colleagues, the very first reunion, back in 1989, and also the IX Brazilian Congress. From the institutional point of view I believe that the implementation of the biomechanics lab and construction of the building where this lab is presently located, along with physiology and other labs, were major accomplishments." Certainly, when Tony Guimaraes was killed in a cycling accident late last year, the biomechanics community lost a valued member.

In this newsletter there is a "Call for Bids to host ISB2009". Walter Herzog is coordinating this effort. While the notice in this newsletter will hopefully attract one or two additional proposals, I already know that Walter has received positive feedback from biomechanists in Europe, South America and Africa. I see this as evidence of tremendous vitality within the ISB membership. From personal experience I know that hosting an ISB congress requires considerable commitment, and I would like to thank those who are willing to "put their neck on the line" in this regard! It also goes without saying that it is often difficult for the ISB Council to choose between two or more excellent proposals. While I'm looking forward to receiving bids for 2009, I already know that it is going to be a difficult case of balancing (i) geographical location, (ii) travel costs, (iii) historical precedence, (iv) political factors, (v) quality of the proposed program and (vi) depth and breadth organizing committee.

While on the topic of ISB congresses, a number of Past-Presidents of ISB suggested that the Council review the duration of these meetings. The issue is that, as ISB's satellite events become more popular, attendees are facing the prospect of a meeting on a Thursday and Friday, followed by a weekend *en route* to the main congress, and then a 5-day conference. If there is a day at the beginning, and a day or two afterwards for the return trip, some people are away from their lab for almost 2 weeks. If you have any thoughts on this, please feel free to contact me with any suggestions or comments.

Finally, I was recently made aware of a feature in both MSWord and Wordperfect that others may find useful. If you click on "tools", you can select the "Flesch Index" which rates how complicated your writing is (a score of 100 is easy---see: http://en.wikipedia.org/wiki/Flesch-Kincaid_Readability_Test for more information). The Flesch score for this column is about 43, comparable to the instructions for completing tax forms in the USA.

Speaking of which….I have some work to do!
Brian Davis, Ph.D.
ISB President

Developments in the field of clinical biomechanics in Brazil seen from a physiotherapy perspective.

The Brazilian Association holds bi-annual congresses around Brazil and the last two were held in Ouro Preto/Minas Gerais in 2003 and in João Pessoa/Paraíba in 2005. Next year's congress will be held in Rio Claro/São Paulo. The congress is open to foreign scholars and individuals such as Dr Sandra Olney and Kenneth Holt who have been in attendance.

I participated in the ISB special meeting (forum discussion) on developing countries, and while there were many positive suggestions in terms of sharing basic equipment and reference books, little of this has filtered down to our labs. The experience in Cleveland was fantastic with high quality papers, full service receptions, dinners and a very efficient organization. The reduced registration for students was appreciated, but lower fees for registrants from developing countries, such as Brazil, as occurs in other international congresses based upon the United Nation's classification, would increase our attendance at these meetings. In addition, if members from developing countries were involved in the congress organization, such as being part of the review process for submissions and eventually the decision-making bodies, this would facilitate obtaining more funds to attend and participate in ISB's activities.

At the Federal University of Minas Gerais (UFMG) in Belo Horizonte, we will be starting a doctoral program this year in physiotherapy with one research option being in the field of biomechanics. We have had some masters students who worked in this area and their thesis titles are listed below:

- Changes in stiffness and in rest position of elbow joint associated with two training programs of muscular hypertrophy
- Assessment of co-contraction and eccentric muscle activity contribution to stiffness regulation of the elbow joint
- Impact of flexibility on muscular performance of the knee joint
- Electromiographic analyses of the trapezius and serratus anterior and assessment of shoulder rotator performance in individuals with impingement syndrome
- Gait aquisition in typical developing children: A dynamic systems perspective
- Comparison of respiratory patterns and thoraco-abdominal configurations at rest and during three levels of effort with sedentary women
- Impact of muscular performance measures of lower limb on balance, fear of falling and aerobic capacity on the episodes of falls
- Sit-to-stand movement with young and elderly subjects
- Impact of measures of muscular performance and proprioception on functional levels of individuals with knee osteoarthritis
- Sit-to-stand movements in individuals with Parkinson's disease
- Muscular adaptations in cerebral palsy children and their relationships with manual function
- Functional and structural cervical spine dysfunctions with temporo-mandibular disorders
- Relationships between the six-minute walk test and ergometric tests in individuals with permanent cardiac pacemakers
- Co-contraction of quadriceps and hamstrings during gait with elderly with and without knee osteoarthritis
- Comparisons of two intervention programs on changes in muscular properties: Strength at the beginning of the range of motion X stretch
- Respiratory patterns and maximal respiratory pressures in individuals with Parkinson's disease
- Mecanisms of articular stabilization after anterior cruciate ligament reconstruction
- Assessment of balance with 4, 6, and 8-year old children: A functional perspective
- Impact of pain intensity on functional capacity of obese individulas with knee osteoarthritis
- Reliability of applied force during anterior-posterior mobilization of talus and its effect on goniometry measures of ankle dorsal flexion
- Predictive factors of mobility gains of cerebral palsy children after botulin A application
- Gait acquisition in normal children and children with Downs' syndrome: Use of neuromotor strategies
- Respiratory patterns and functional performance of oral breather children
- Muscular co-contraction during walking at initial contact: A comparative study between young and old women
- Gluteus maximus eletromyographic activation during four modalities of therapeutic exercises

Slowly, we are setting up our labs, which according to the Brazilian reality, are fairly well equipped with the options of using equipment such as Balance Master, Qualysis motion analysis system, EMG, Biodex isokinetic dynamometer, etc. We have a keen interest in special populations such as elderly people, stroke victims, parkinsonians, cerebral palsy children and athletes. However, we do not yet have adequate support staff, such as engineers and technicians, to modify our research protocols. Besides, at this time, our motion analysis is restricted to temporal, spatial and kinematic data. We are working on application grants for acquisition of at least one force platform, which will allow us to obtain kinetic data.

Finally, Brazil will win the FIFA World Cup in spite of the fact that they do not use biomechnicians at top level!

Sincerely submitted

Luci F Teixeira-Salmela, Ph.D.

An overview of biomechanics and biomechanical engineering in Brazil

After many years working as a scientist in Sweden, a Brazilian colleague received the Swedish, at the same time as a Russian soccer player. The odd happening deserved a notice in the local newspaper… While Brazilian soccer and soccer players, the Ronaldos, Cafu, Romario and others are very well known everywhere in the world, Brazilian science and scientists are rarely mentioned.

In this article, we will try to give a brief description of the current status of the research within the field of biomechanics being carried out mainly with participation of mechanical engineers, but also including civil, mechatronics and materials engineering. We do not intend to cover the whole spectrum of "Brazilian Biomechanics", since most of the work is being carried out elsewhere, by people from other engineering specialties, physics, biology, medicine, physical education etc. As secretaries of the Bioengineering Committee of the Brazilian Society of Mechanical Sciences and Engineering, the authors believe that they can roughly express the thoughts of most of the researchers linked to this Society, strongly related to mechanical engineering. Therefore, we use the term "Biomechanical Engineering" to assign the focus of this article.

Biomechanical engineering and its financing in Brazil

Biomechanical engineering is an area with a strong interdisciplinary character, gathering aspects of medicine and mechanical sciences, aiming at the understanding of biological processes, often also including their computational simulations. Starting from there, it should be possible to build apparatus and auxiliary devices or to optimize processes that intervene with life and the human body.

Therefore, a sub-area of biomedical engineering could be considered which, in Brazil, traditionally means strong focus on the application of principles of electrical engineering in the development of devices and processes in the mentioned context. Brazil has several well skilled and consolidated groups with these characteristics.

Our feeling is that we have not found much space for the growth of groups with another focus, different from electrical engineering. In biomechanical engineering, most research is carried out in departments of civil and mechanical engineering in different parts of Brazil. Even though there are people in different regions of the country doing research in biomechanical engineering topics, we can hardly speak of Brazilian biomechanical engineering as a well established discipline.

The biomechanical engineering proposal is to adapt the knowledge of structural and fluid mechanics, thermal sciences and system dynamics to biological and medical problems. Of course, there does not exist a clear frontier among the sub-areas: biomechanical engineering will also deal with knowledge related to control, electric circuits, materials science, but with a different focus.

Furthermore, biomechanics as understood by researchers within sports or physical education does not fully correspond to biomechanical engineering, primarily because the mechanics of movement and not the mathematical modeling of the analyzed processes. The researchers within both sub-areas have different objectives; we could state that it is the work done by the engineers developing models and equipment that will be used by the doctors and biomechanicists.

Biomechanical engineering is a growing area an the international context. This can best be observed by following the number of scientific papers related to this area at the Winter Meeting of the American Society of Mechanical Engineering (ASME). In the last years there has been a great increase in the number of papers devoted to biomechanical engineering. Several universities in the US reformulated their curricula to include biomechanics. The situation is similar in Brazil, where researchers of several areas dedicate part of their time to problems of biomechanics. However, the choice of this area as main field of activity is not common. That can be checked by looking at the list of researchers with a CNPq[1] fellowship for productivity in research. CNPq, the Brazilian funding agency, has been directing the biomechanical engineering funding applications and projects to the Electrical Engineering Committee, which analyses biomedical engineering themes. But the committee representative in the area has always had a background of electrical engineering, making it quite difficult to have a project on biomechanics analyzed by experts from the area. The community reacts to the lack of funding hiding their projects as applications of mechanical, civil, material engineering (or others) and

[1] CNPq (Conselho Nacional de Desenvolvimento Científico e Tecnológico / National Council for Scientific and Technological Development – www.cnpq.br) is a foundation linked to the Ministry of Science and Technology to support Brazilian research. Among several modalities of support, CNPq provides scholarships to researchers in the country.

including topics of biomechanical engineering in their proposal. However, many people with a more conservative view of what engineering is and what is not, do not consider, for example, that biomechanical engineering is part of mechanical engineering, or they do not want to share a quite limited budget with a newly established area. As we can see, the problem of defining exactly a *fuzzy* reality as biomechanics is not simple. "Nature knows nothing about disciplinary boundaries"[2], but science funding agencies do.

As one consequence, many of the young engineers with a Ph.D. thesis in biomechanics should have to dedicate most of his or her energy to survive scientifically in research areas where financing is easier in Brazil, like petroleum, robotics, energy, automotive industry and so on. This means that many of us at the beginning of a research career risk ending up doing it almost as a hobby if you started with biomechanics.

The contribution of Brazilian biomechanics and biomechanical engineering in the World

Brazilian participation in the world science scenario[3] has been scarce until the end of the 80s, when Brazilian papers in journals indexed by ISI (Institute for Scientific Information) were about 2500 papers/year, or 0.5% of the papers, in all fields, published in the world. A reasonably well successful national policy of support to science and technology was able to increase these numbers to about 12000 papers/year, corresponding in 2002 to 1.55% of the papers published in the world and 45% of the papers published in Latin America. Brazil formed about 8000 Ph.D.s in 2003[4]. The increase in the absolute number of papers from 1981-2002 was 498%. It is a reasonable mark, compared to U.S. with 43%, Spain 579% (at the same time this country entered in E.U.), but weak if one looks to Asian developing countries, with astonishing grows marks of 1939% in China and 6701% in South Korea.

To get an idea of the current status of the Brazilian productivity in biomechanics, we have performed a search for Brazilian papers in this field using ScienceDirect Database[5]. The sample was taken from four journal titles, which reasonably cover important fields of biomechanics: *Journal of Biomechanics*, *Clinical Biomechanics*, *Gait & Posture* and *Medical Engineering & Physics*. The search was constrained to Articles, Review Articles, Short Surveys and Short Communications. The annual absolute total number of Brazilian publications is shown in Figure 1. The total number of Brazilian papers from 1990-2006, classified by journal title and researcher origin (non mechanical engineering / mechanical engineering) is shown in Figure 2. We have calculated the average number of Brazilian papers from 2000 to 2006. The four Journal titles were published in this period 3.307 papers match the constraint criteria above, 26 among them from Brazil, or 0.75% of the papers. Looking for other biomechanical engineering related journal titles, namely *Artificial Organs* and *Biomaterials*, we found about 50 (14% of the papers) Brazilian papers in the first title and 42 in the second (1.2%).

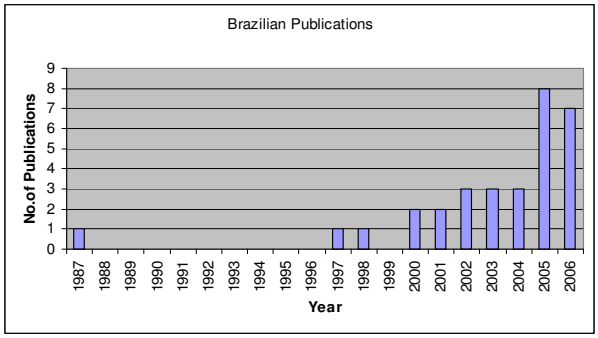


Figure 1: Number of Brazilian papers published in J. Biomechanics, Clinical Biomechanics, Gait & Posture and Medical Engineering & Physics. The year of 2006 includes the papers published and *in press* until March.

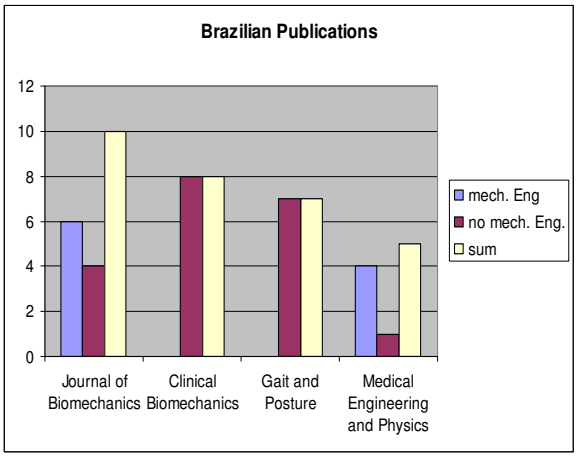


Figure 2: Number of Brazilian papers published, by journal title, in the period 1990-2006 by mechanical engineers and others.

Some reasons may be pointed out in order to explain the Brazilian scientific growth: a reasonable amount of investment in Science and Technology, around 1% of the National Income (U.S. invests 2.7%), the evaluation of the graduate student programs through scientific productivity, and the availability of a nationwide on-line Scientific Database[6], etc.

[2] Report of the National Science Board Commission on the Future of the National Science Foundation, November 20, 1992
http://www.nsf.gov/pubs/stis1992/nsb92196/nsb92196.txt

[3] http://www.mct.gov.br/estat/ascavpp/ingles/menu6page.htm

[4] http://www.brasil.gov.br/pais/brasil_temas/ciencia_tec/intro_cet

[5] http://www.sciencedirect.com/

[6] CAPES (Coordenação de Aperfeiçoamento de Pessoal de Nível Superior) database
http://www.periodicos.capes.gov.br/portugues/index.jsp allows

A pattern of growth similar to the all science fields in the country can be observed in biomechanics, as 10 years ago nobody published almost anything in the four mentioned journals. Nowadays, the situation is better, in spite of the fact that in the last year we have contributed only with 0.75% of the papers. It remains a question if the growth is sustainable, but we do believe it considering the consolidation of the research groups. In Figure 2, it can be observed that Brazilian mechanical engineers preferably publishes their papers in *Journal of Biomechanics* and *Medical Engineering & Physics*, while researches from other fields (mainly biological, medical and sports science related areas) divulge their works in more clinically oriented journals. It also shows a reality that we feel in our everyday life: we often talk with our health science colleagues above having joint research projects, but many of us have not been able to effectively produce science together[7].

Within the field of artificial organs, which is an area that demands a lot of mechanical engineering, the significant presence of Brazilians should be praised, and it reveals the great effort of Brazilian cardiology to achieve a world-level state-of-art, namely the groups of INCOR[8] (Heart Institute, University of São Paulo) and IDPC (Instituto Dante Pazzanese de Cardiologia). Within biomaterials, an area of relative success compared to other fields of biomechanics, the collaboration of mechanical, materials engineers and researchers from dentistry helped to make it more consolidated at several institutes. In addition, there is a significant amount of materials scientists working in Brazil formed to support the boom of Brazilian industrialization in the late 60's and all the 70's, especially in civil, metallurgical, aeronautical, electronic, petroleum and nuclear industry.

Social relevance of biomechanical engineering to Brazil and other developing countries

The increasing demand for health-associated technologies has not been met in the developing countries mainly due to the very high development costs. This situation leads to the absence of appropriate resources for a large part of the population because of high costs required to bring the technologies and equipments from abroad[9]. However, previous experience from many of the engineers working in medical equipment development shows that it is possible to reduce costs substantially for a large part of the required technologies. To a great extend, many of the thoughts presented in this section should be considered in a biomedical or clinical engineering context, and even public health. Again, it should be said that biomechanics, biomedical engineering or biomechanical engineering deals with nearly the same problems, but with different focus or methods.

The case of cardiology is highly emblematic for the relevance of wise investing in biomedical technologies in a developing country. Brazil has a high standard of cardiology services that reasonably covers all social segments. Thanks, along with other reasons, to continuous investments in heart biomedical engineering (in Figure 3: Heart Lung Machine developed by INCOR). In other fields, like diabetes or orthopedics, quite different levels of assistance and material quality are used among the poor and the rich[10]. Needless to say, only scarce academic productivity and local industrial development are found in the latter areas.

Figure 3: Heart Lung Machine developed by INCOR[11]

In our opinion, there is a great capacity for improvement in the Brazilian biomedical equipment industry, in close interaction with the R&D community, and with a more venturous investing, including the Government, which, after all, should be the greatest consumer of biomedical technology, since it assists the major part of the population. In many cases, the *highest-tech on-the-frontier* imported equipment, whose demand is many times dictated by strictly mercantile

---

the access of 9640 journal titles, 90 scientific databases to 163 research institutions. In the 1st semester of 2005, 6.651.840 papers have been downloaded.

[7] The interaction between people in Brazil is one of the big problems to handle if you speak of regular cooperation. It is expensive to travel in a huge country like Brazil, and normally there is not much support for it.

[8] http://www.incor.usp.br/

[9] According to ABIMO (Association of the Manufacturers of Medical and Dental Products), http://www.abimo.org.br/ingles/default_interno.asp Brazil imported in 2004 U$ 979,808,000.00 and exported only U$ 317,879,000.00

[10] A 75% of the Brazilian population depends exclusively on the State Healthcare System (SUS) (Negri and Di Giovanni, in Brazil: Radiografia da Saúde, Ed. Institute of Economy, State University of Campinas, 2000.

[11] http://zerbini.bportal.com.br/unidades_apoiadas/bio_engenharia/en-us/index.html

forces, may not be the solution that maximizes the assistance to many people currently excluded from the system. The Brazilian situation is not essentially different from other Latin American countries or a large part of the developing countries. On the other hand, Brazil gathers all the required elements necessary to acquire a scientific and technological leadership of developing and spreading these technologies in order to make them accessible to a majority of the population. These elements shall be effectively updated through medium and long term financial strategies and high academic level group consolidation.

Concluding remarks

Biomechanical engineering is an area in constant growth thanks to the social relevance it deserves and to the convergence of different technologies coming from different fields of knowledge. Several developed countries have groups at their universities and research institutes with strong industrial ties and with successful spin-offs. The current situation in Brazil signs to growing, but, once more, it is possible to feel a greater and imminent loss of connection with the global state of the art, as it has occurred in several technology fields in different times. Brazil has groups that are able to produce good results, but these results are not multiplicative. It lacks a better infrastructure and more organicity to surpass the intergroup isolation. On the other hand, the feeling caused by the demanding social necessities motivates many young engineers who join the research groups to work in the field, and leads to the possibility of making biomechanical engineering which is a key subject to the Brazilian technological development.

The community of biomechanical engineers believes that an important step for increasing scientific productivity and technological development could be the creation of a multi-institutional "Institute of Biomechanical Engineering", and a "Biomechanical Engineering Network[12]", which inherent goal should be to create a highly integrated net of scientific and technologic research among researchers of different institutions, with complementary abilities. The idea is to connect the community more effectively, give it an identity and structure the channel that connect the people at the university with people who are willing to develop and manufacture a product. We are sure that the attainment of the proposed objectives will allow Brazil to reach another development level in an area that is strongly connected to life quality. The practice of more and more intense physical activities on one side and the aging of the population on another side leads to a commercial interest in the offer of apparatus, devices and processes that help the welfare of population as a whole. For not being completely dependent of imported products in an area where much can be done by small and medium sized industries, it is indispensable with training in a systematic way of the technical and scientific community and, therefore, of graduate and undergraduate students. This development must be done in interaction with knowledge from abroad, using available results and adapting products to Brazilian needs. However, the consolidation of this community depends on a signalization from governmental institutions, that wish coming from the people within research, but also a priority for the country. Two attempts to create the Institute in 2001 and 2005, through the Millennium Institute program from CNPq[13], were not successful.

Given this picture, an investment to consolidate the biomechanical engineering area in Brazil shall result in significant improvement of the national health quality through the submission of patents for Brazilian instruments, equipments and systems (with an eventual import taxes reduction), through the use of more adequate computational resources on the hospital environments and through the appearance or strengthening of small technology-based companies that will aggregate young researchers and will help to maintain a self-sustained network and its benefits.

Luciano Luporini Menegaldo[1,3],

Estevam Barbosa de Las Casas[2,3]

[1]Military Institute of Engineering, Department of Mechanical and Materials Engineering,
Rio de Janeiro; e-mail: lmeneg@ime.eb.br,

[2] Federal University of Minas Gerais, Structural Engineering Department. Belo Horizonte
e-mail: estevam@dees.ufmg.br,

[3] Bioengineering Committee, Brazilian Society for Mechanical Sciences and Engineering (ABCM),
http://www.abcm.org.br

Acknowledgements

Most of the ideas of this article are consequence of many talks, writing papers, project appliances, and daily acquaintance with several colleagues, who should sign this text together with the authors, in special, José Augusto Lopes, Djenane Pamplona, Hans Weber, Agenor Fleury, Marcos Pinotti, Raúl Gonzales, Flávio Trigo, Celso Pesce and Jayme Ortiz.

Directory of Biomechanical Engineering Activities in Brazil (click link below):
http://isbweb.org/o/images/stories/documents/Menegaldo-2.pdf

[12] An example of a similiar network is MediTech, a reserach network for medical engineering, created by the Carfiff University (http://meditech.cf.ac.uk/)

[13] http://www.cnpq.br/servicos/editais/ct/edital_0105_milenio.htm

Laboratory of Biomechanics of Human Movement and Posture
Department of Physical Therapy, Speech and Occupational Therapy, Faculty of Medicine, University of Sao Paulo, Sao Paulo, SP, Brazil.

Laboratory Team
Coordinator: Dr. Isabel de Camargo Neves Sacco
Associated Researchers: Dr. Sílvia Maria Amado João - Physical Therapy Course, University of Sao Paulo, Brazil; Dr. Amélia Pasqual Marques - Physical Therapy Course, University of Sao Paulo, Brazil; Dr. Raquel Casarotto - Physical Therapy Course, University of Sao Paulo, Brazil; Vitor Tessutti.
Graduate Students (Masters Degree): Carla Sonsino Pereira (financial support provided by FAPESP), Eneida Yuri Suda, Paula Marie Hanai Akashi; Sandra Aliberti; Tatiana Almeida Bacarin.
Undergraduate Students (Scientific Programs): Ludmilla Carrijo (financial support provided by FAPESP); Maíra Grizzo Canettieri (financial support provided by FAPESP); Ricky Watari (financial support provided by PIBIC – CNPq).

Fundamental Research Area
Human Movement and Posture

Research Area - Detailed Description
Biomechanical Methodology: Development of studies that test methodologies in biomechanics and in functional evaluation of the human movement. Our purpose has been to provide evaluation protocols and more appropriated methods for different population with or without associated pathologies.
Biomechanics of Normal and Pathological Human Locomotion: Development of studies related to the investigation of biomechanical parameters of muscle activity, dynamics and kinematics in different pathological and non-pathological situations, seeking for comprehension of causes and effects of these intervenient conditions.

Laboratory Activities

- Development of researches related to the Biomechanics of the Human Movement and Posture;
- Development of researches in the area of Biomechanics with Physical Therapy graduate students.
- Development of researches related to biomechanics of the Human Movement and Posture with undergraduate students participating of Scientific Programs.
- Development of Scientific Activities (seminars, small courses, lectures and classes) performed with the Group of Study in Biomechanics.
- Involvement in Scientific Programs Conferences of the University of Sao Paulo and other universities.
- Preparation of articles to publish in national and international scientific periodic.

Equipments
- Hip, Knee and Ankle Eletrogoniometer – **Biometrics**
- Pedar in-shoe System – **Novel**
- Force Plate – **AMTI**
- 8 superficial channels Electromyography **- EMG System of Brazil**
- 2 digital photo cameras – Canon and Sony

- 3 pedigraphs – plantar impression
- Planimeter – Digital Placom
- Digital scale
- 4 desktops
- Notebook Toshiba Satellite 315 CDS
- Notebook HP
- Printer Lexmark E210 laser
- Multifunctional HP HP Office jet PSC 750
- 3 Nobreaks Ragtech 1,5 KVA
- Full Human skeleton
- Monofilaments Semmes-Weinstein
- Specifics software to biomechanical analysis of human locomotion
- Math and statistical software

Developing Researchs
Biomechanical Methodology

2004 – Actual. Comparative biomechanical study of evaluation methods of leg length discrepancy in runners.
Students involved: Undergraduate students
Researchers: Isabel de Camargo Neves Sacco (Advisor); Mariane Andrade
Financial Support: FAPESP (scholarship).

Biomechanics of Human Locomotion - Normal and Pathological

2004 – Actual. Biomechanical study of Diabetic Neuropathic Locomotion wearing and not wearing habitual shoes.
Students evolved: Undergraduate, Masters degree students
Researchers: Isabel de Camargo Neves Sacco (Advisor); Tatiana de Almeida Bacarin, Ricky Watari, Ludmilla Carrijo Sousa, Maíra Canettieri, Paula Marie Hanai Akashi.
Financial Support: FAPESP.

2004 – Actual. Biomechanic of gait of individuals with Diabetic Neuropathy: distribution of plantar pressure during walk at flat surface with and without habitual shoes.
Students evolved: Masters degree student
Researchers: Isabel de Camargo Neves Sacco (Advisor); Tatiana de Almeida Bacarin.
Support: University Hospital (cooperator).

2003 – Actual. Muscle activity control during locomotion tasks at ankle functional instability.
Students evolved: Undergraduate, Masters degree students
Researchers: Isabel de Camargo Neves Sacco (Advisor); Angela A Vasconcelos; Cristiane Akie Kawamoto; Eneida Yuri Suda; Henrique Y Takahasi; Jeane Cintra Peixoto; José Augusto Fernandes Lopes; Linamara Rizzo Battistella.
Support: Division of Medical Rehabilitation - FM-HC-USP-DMR (cooperator).

2003 – Actual. Anthropometrical and biomechanical comparative assessment of the locomotion in runners with and without structural leg length discrepancy.
Students evolved: Undergraduate, Maters degree students
Researchers: Isabel de Camargo Neves Sacco (Advisor); Carla Sonsino Pereira; Mariane Andrade.
Financial Support: FAPESP (scholarship).

Federal University of Santa Maria

Physical Education and Sports Centre

Laboratory of Biomechanics – LABIOMEC

Carlos Bolli Mota, Dr
Felipe P Carpes, Msc

The Laboratory of Biomechanics of the Federal University of Santa Maria (UFSM) is one of the first's biomechanics laboratories created on Brazil. It is located on the state of Rio Grande do Sul in the extreme south of Brazil, in the city of Santa Maria. The head of the lab is Mr. Carlos Bolli Mota. Dr Mota is graduated on Mechanical Engineering and had received the doctor degree in Human Movement Science by the UFSM in 1999, when he concluded a research concerning a computer software development to accomplish anthropometrical measures of the human foot based on digital image processing.

The history of the laboratory had started at 1976, when Dr. Hartmut Riehle carry out the first specialization course on the field of Biomechanics in Brazil. Since this year the interest on the Biomechanics is increasing by UFSM academics. In 1984, the Laboratory was officially created and until now more and more academics and professors are evolved with the laboratory activities.

The actual researchers fields conducted on the Laboratory are related to:

Cycling, Athletics, Running, Human Gait, Human Balance, Weight lifting, and Instrumentation.

The laboratory has the following devices available for researches:

- Peak Motus System, with two high-frequency cameras (sample rate of 60 or 180Hz);
- Two AMTI force plates (3D forces and moments);
- Fscan System (in-soles and Matscan);
- Photo cells (six);
- Bilateral strain gages instrumented pedals (developed on the laboratory);
- Ciclosimulator Computrainer ProLab 3D.

Among the actual researches developed on the laboratory we can cited a study about the effects of shoe heel height wearing by children with age range from 4 to 6 years. The study was published on the Brazilian Journal of Biomechanics in two papers (*Braz J Biomech* 9:45-50, 2004; *Braz J Biomech* 10:05-10, 2005). Three types of shoes, with different height heels and declivity angles had the effects tested during the walk. The three-dimensional angles from pelvis, hip, knee and ankle were evaluated.

Other significant study is carrying out at this time by Msc. Ivon Chagas da Rocha Junior, an expert on the running field. Mr Rocha Junior have tested the biomechanics performance indicators when younger runners (from 10 to 16 years old) are guided with common tips used on the training, as example, the orientation to running looking at a point of reference located at the finish of the course. At this regard, studies about the relationships between the running kinematics, velocity curves, and lactate curves during the 100 m race are being studied.

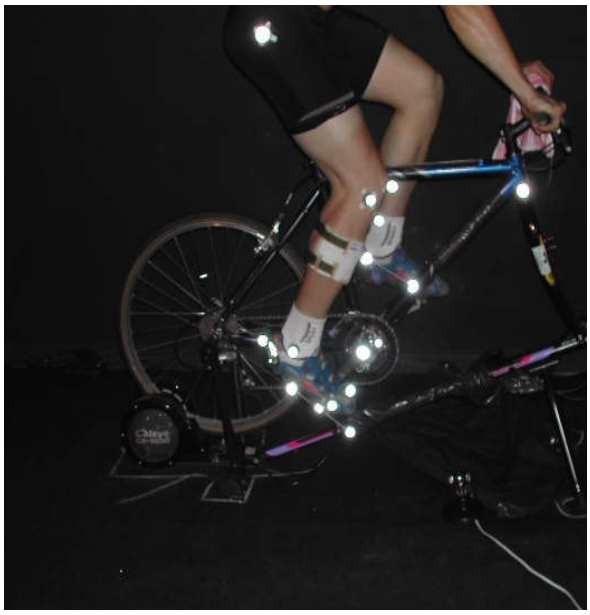
Lamentably, the Physical Education faculty of the Federal University of Santa Maria doesn't have a post-graduated program for Master and Doctoral degrees. It has only a specialization course, what reduce the financial resources received by the researchers to conduct the studies. Some researches conducted on the laboratory are developed in partner with others post-graduated programs of the UFSM and also others Universities to overcome this limitation as well as some private companies.

Cycling Research and Study Group, GEPEC-Brazil

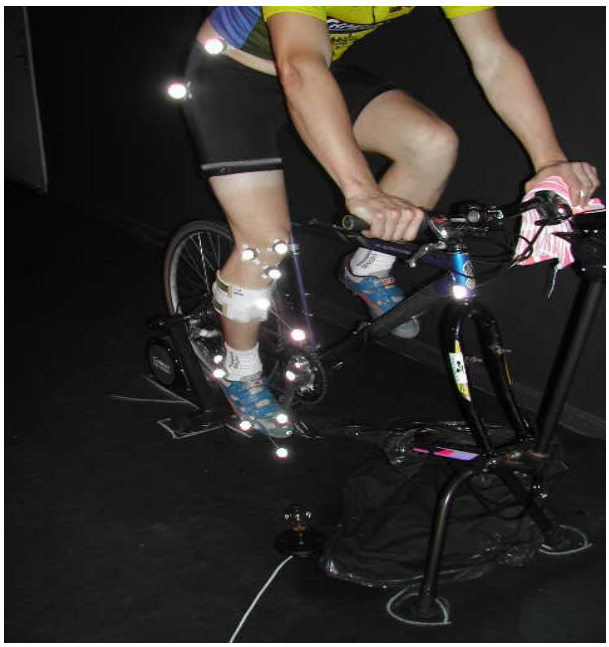
In the Laboratory of Biomechanics is inserted the Cycling Research and Study Group (GEPEC), leaded by Mr. Felipe P Carpes under supervision of Dr. Mota. Mr Carpes is graduated on Physical Education and had received your title of Master degree in Industrial Engineering by the UFSM, carrying out a development of a system of bilateral strain gage instrumented pedals. The research fields of the group are the pedaling technique (pedal forces), cycling performance simulated, EMG and kinematics.

Two of the more expressive researches accomplished by the group are the studies about the pedaling asymmetry during cycling 40km time-trial (submitted for publication) and the pedaling asymmetry at different exercise intensity (accepted for publication by the Journal of Sports Sciences). A recent studied carried out by the group was a biomechanical evaluation of the Rotor Cranks (manuscript ready to submission). The Rotor effects on the 3D lower limb kinematics were analyzed during cycling at workload of 300 W and preferred pedaling cadence. Three-dimensional angles were calculated from the position of landmarks at specific anatomical location, crank and pedal reference points such as the figures below.

The group has a social commitment in the city of Santa Maria, where the physical education students associated to the GEPEC perform bicycle body positioning evaluation for the recreational and competitive cyclists free of costs. The GEPEC are also beginning saddle pressure measurements using the Fscan adapted to the bicycle saddles with the purpose of verify the effects of saddle configuration and power output on the perineum pressure during pedaling.



Landmarks used on the kinematics evaluation.



Among the developed studies, some papers are under review on scientific journals, as example, papers about the Effects of saddle position on pedal forces; Pedal forces, EMG and economy during cycling in aerodynamic position; Kinematics characteristics of cyclists across disciplines; and Economy/efficiency *vs* power output and oxygen uptake during endurance cycling exercise.

Orbituary
ANTÔNIO CARLOS STRINGHINI GUIMARÃES

Prof. Guimarães (or simply "Tony" as he was known by his overseas friends or "Guima" by his Brazilian friends) was born in Porto Alegre on August 23rd 1952 and died tragically when a car hit him on October 22nd 2005.

Tony was one of the first biomechanists in Brazil. He received his Bachelor's degree in Physical Education from the same school he worked for, the School of Physical Education of the Federal University of Rio Grande do Sul, in Porto Alegre, RS, Brazil.

After graduating, Tony went to the University of Iowa where he received his Master's degree under the supervision of Prof. James Hay in 1982. For his Master's thesis, Tony studied the biomechanics of the "grab" starting technique in swimming. After the completion of his Master's degree, Tony returned to Brazil and taught Biomechanics to undergraduate students from 1982 to 1989. During this period, he started to work with electromyography and abdominal exercises. He studied the effects of abdominal exercises on physical fitness and the loading of the spine, and he used this information to make specific recommendations to Physical Education and fitness teachers.

In 1989, Tony went to the University of Calgary to pursue doctoral research under the supervision of Prof. Walter Herzog. There, he studied the EMG-force relationship for dynamic muscle contractions. After his doctoral work, he once again returned to Brazil and started to work in the area of Sports Biomechanics, and his latest work was concerned with the biomechanics of the triathlon. He published extensively in the area of Sports Biomechanics and was particularly well known for his research in swimming mechanics.

Aside from his contributions to research and the education and supervision of numerous students, Tony was instrumental in founding the Brazilian Society of Biomechanics. He was the president of the first Brazilian Congress of Biomechanics, which was held in Porto Alegre in 1986 (which was called 1st meeting of professors of biomechanics and kinesiology at that time), and he was the conference chair of the 9th Brazilian Congress of Biomechanics, which was held in Gramado in 2001. However, despite all the work in getting Brazilian biomechanics off the ground, he realized that a next step was to internationalize biomechanics in Brazil and put Brazil on the scientific map of the world. In order to achieve this goal, Tony was passionately involved and was the leader of an ambitious effort to organize a bid to host the 2009 ISB Congress in São Paulo. He felt that it was time for Brazil to come out of its isolation, and to expose South American scientists and probably even more importantly, students, to the international world of biomechanics research.

Besides his scientific and professional contributions to the world of biomechanics, Tony was an avid athlete who loved movement and sports. In his beginnings, he was a swimmer, and taught swimming courses at our Faculty for many years. Later, he discovered a love for running and he became one of Brazil's foremost master level triathletes. Triathlon became his private and his scientific passion.

But above all, Tony was a kind and generous mentor, teacher, colleague and friend who made friends wherever he went. Because of his talent in dealing with people and understanding their problems and needs, he became involved in administration and served as the Dean of our Faculty from 1997 to 2000. Just before his death, he was the Associate Rector of Extension Programs for the Federal University of Rio Grande do Sul, and as with everything in life, he enjoyed this new challenge and tackled it with fierce ambition. Among his numerous duties and responsibilities, he also served as an ad hoc consultant for several Brazilian Research Agencies (CAPES, CNPq, FAPERGS, FAPESP) and was a member of the Editorial Board of the Brazilian Journal of Biomechanics, the Portuguese Journal of Sports Science and of the São Paulo Journal of Physical Education.

Tony also held a Visiting Professorship at the University of Porto in Portugal, where he taught graduate courses on electromyography for many years. Tony was outspoken and had strong believes, but he was fair thus gained the respect of scientists around the world. He faced every challenge with a big smile and encouraged his students to go beyond where he had gone, and their achievements were his proudest memories.

Tony was hit by a car early on Saturday morning October 22nd while on a training ride with triathlon friends. Perhaps his biggest contribution to all of us who had the privilege to work with him or share his life was his way of living life with a great sense of humor, never taking anything for granted, never taking himself to seriously, and living each day to its fullest. Enjoying the beauty of life is the task he left for his wife Denise and his son Carlos. In 2005, they received the Brazilian Sports Merit Medal, the highest distinction given by the President of Brazil for individuals who made great contributions to the development of sports in the country. The impact of Tony's contributions to biomechanics and sports in Brazil will be seen for many years to come, and his memory will live on in the work he shared with the scientific community and his students and friends around the world.

Dr. Marco Aurélio Vaz
Professor, School of Physical Education
Federal University of Rio Grande do Sul

This year's ISB student awards

ISB Dissertation Grants:

Arya Shruti	University of Southern California
David Colman	Brunel University
Jason Forman	University of Virginia
Susan Kotowski	University of Cincinnati
Silvio Lorenzetti	ETH Zurich
Scott Lucas	University of Virginia
Joseph Seay	University of Massachusetts
Becky Zifchock	Universeity of Delaware

Travel Grants

Diane Gregory	University of Waterloo
Melissa Thompson	University of Colorado

News from the XXI ISB2007 Congress in Taipei, Taiwan

First announcement of tutorials at the XXI ISB2007 Congress in Taipei, Taiwan in 2007

Lectures being held Sunday morning and early afternoon, July 1,
before the opening ceremony of the congress.

- Muscle mechanics:Prof. Haruo Sugi, Saitmaken, Japan

- Animal locomotion: Prof. Alberto Minetti, Manchester, Met.Univ.UK

- Biological inspired robotics: Prof. Robert Full, Univ. of California,Berkeley

- Foot and ankle joint biomechanics: Prof. Sorin Siegler, Drexel Univ., Pennsylvania

Check the homepage of the congress for more updates: (www.isb2007.org).

Tzyy-Yuang Shiang
Organizer of ISB 2007

News from the International Shoulder group

A date has been set for the 2006 meeting of the ISG. The meeting will take place in Chicago on 9-10 October. The announcement is on the website here: http://isg.case.edu/node/59

Call for proposals for THE XXIIth CONGRESS OF THE INTERNATIONAL SOCIETY OF BIOMECHANICS (2009)

Persons or groups interested in organizing an International Congress on Biomechanics are invited to prepare and submit a formal proposal to the ISB Executive Council through the President-Elect. Included in the proposal should be detailed information about the following aspects:

1. *Organizer*
Describe research interests and activities of the proposed organizer(s) and explain, why you desire to organize the Congress. Provide a description of your institution or department with its principal areas of research.

2. *Dates*
Indicate the exact dates proposed for the Congress. Careful consideration should be given to university vacation periods in major countries, and the attractiveness of visiting your part of the world at that time of the year.

3. *Support*
Outline your sources of financial support such as government, university, institutes, industry, sports organizations, etc. If possible enclose a letter of support from the chairman of your Department, Institute Director, President of the University or a similar official. Add a list of professional organizations willing to sponsor the Congress.

4. *Personnel*
Provide evidence of the availability of organizational personnel such as secretaries, housing co-ordinators, business managers, etc.

5. *Budget*
Submit a provisional budget including the major financial arrangements. Indicate the estimated congress fee for participation of members and non-members and list the activities included by this fee.

6. *Facilities*
Provide details of the following:
Housing. Type and approximate cost of accommodation, proximity to Congress meeting place.
Meals. Location and cost.
Meeting rooms. Number of meeting rooms available for the congress, audio-visual systems, capacity of rooms, etc.
Recreational facilities available to participants. Sport fields, swimming pool, running track, exercise room, gymnasium, etc.
Book and equipment exhibit area(s). Possibilities for book and equipment exhibitions.
Research laboratories, planned tours, demonstrations, etc.

7. *Travel arrangements*
Outline the different ways to travel to the Congress, by air, train, bus, boat, private car, etc. Name candidates for official travel agency and airline, if appropriate. Make provision for travel assistance to participants during the congress

8. *Advertisements*
Detail your plans for promoting and advertising the Congress.

9. *Reviewing*
Describe your plans for the reviewing of submitted abstracts and the preparation of the Book of Abstracts.

10. *Publication*
Indicate your plans for editing of manuscripts and for publication of the key-note and award-winning papers.

11. *Activities*
Mention the historical and cultural activities available to participants during or after the conference. Also include your plans for special programs for accompanying persons.

12. *Climate*
Describe the climate to be expected in the area and for the period of the proposed Congress.

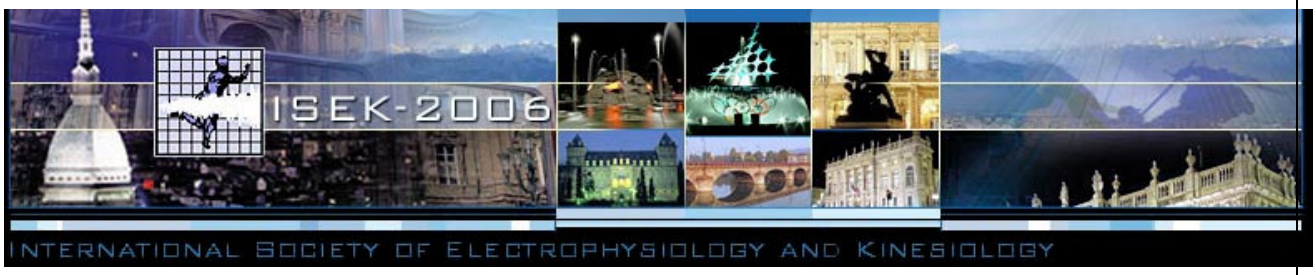
Two copies of the proposal should be submitted by **July 1, 2006** to:

Walter Herzog
University of Calgary
Faculty of Kinesiology
Calgary, Alberta, T2N IN4
CANADA
Phone: +1 403 220 8525
Fax: +1 403 284 3553
Email: walter@kin.ucalgary.ca

Descriptive brochures and other helpful information material should be included. Each proposal will be reviewed and compared to other proposals by members of the Executive Council of ISB.
Applicants should be prepared to attend the ISB Council meeting on July 29th 2006 to present their bids personally.
The final decision will be made by the Council of ISB.

Walter Herzog

Upcoming meetings



FROM RESEARCH TO PRACTICE

XVI CONGRESS OF THE INTERNATIONAL SOCIETY OF ELECTROPHYSIOLOGY AND KINESIOLOGY

Torino, Italy June 28-30 and July 1 2006

I N V I T A T I O N

On behalf of the President and Council of the International Society of Electrophysiology and Kinesiology (ISEK) it is our honour and pleasure to invite you to the XVI Congress of the Society. The Congress will take place at the Lingotto Congress Center in Torino, Italy, on June 29-30 and July 1, 2006. A pre-congress Workshop Session will take place in Torino on June 28 and a post-congress Course on Integrated Movement Analysis in Sport and Exercise will take pla ce at the University Institute for Movement Sciences, (I.U.S.M) in Rome on July 3 and 4, 2006.

ISEK aims to promote and disseminate knowledge in the disciplines of electrophysiology and kinesiology in normal, pathological and experimental conditions. Its members include engineers, physiologists, rehabilitation doctors and physical therapists, medical doctors in the field of sport, occupational and space medicine, ergonomists and a wide range of other professionals and scientists.

The 2006 Conference Theme is “From Research to Practice”. The Keynote Lectures, the Workshops and the Course on “Integrated movement analysis in sport and exercise” will focus on this topic to outline the maturity of the field and its many applications in clinical practice, neuroscience, ergonomics, sport and space research and many new and diverse fields. We invite you to present, learn and discuss new ideas and applications, advance the frontiers of knowledge and enjoy art, history, science and Italian culture in Torino after the Winter Olympics 2006.

Roberto Merletti
LISiN, Politecnico di Torino
and
COREP
Congress Secretary General

Alberto Rainoldi
LISiN, Politecnico di Torino
and
COREP
Congress Scientific Chair

Dario Farina
SMI, University of Aalborg, Denmark
Congress Scientific Chair

IMPORTANT DATES
June 28, 2006
Pre-congress Workshops
Welcome Cocktail
June 29 – July 1, 2006
Conference Presentations and Exhibits
June 30, 2006
Gala dinner

AWARDS
John V. Basmajian Student Investigator Award
DelSys Prize for EMG Innovation
CRT Foundation Award for clinical application
Compagnia di San Paolo Foundation award for basic research
SME (Small Medium Enterprises) Award for technology transfer
SME (Small Medium Enterprises) Award for engineering development

CONGRESS SCIENTIFIC COMMITTEE
Secretary general:
Roberto Merletti
Chairs:
Dario Farina
Alberto Rainoldi
Administrator:
Sara Lecce
Logistics:
Andrea Bottin
CONGRESS ORGANIZATION
MAF Servizi, Torino, Italy
Website: www.isek2006.it

CONFERENCE VENUE
Lingotto Congress Centre, Via Nizza 280, Torino

OPENING CEREMONY
Welcome of the authorities
In memoriam of Prof. Yukio Mano, Secretary General for ISEK 2000 Toshio Moritani
Opening Speech
Roberto Merletti

SOCIAL PROGRAM
Welcome Cocktail at the Cinema Museum (Mole Antonelliana)
Gala dinner at the Arsenale Palace

REGISTRATION FEES
Congress registration fee: 400 Euro
Workshop registration fee: 60 Euro
Cost of teaching material of each workshop: 20 Euro

PRECONGRESS WORKSHOPS

Workshop proposers are responsible for the organization of the workshop, the invitation of speakers and the preparation of teaching material for distribution. The Congress Organization will not cover the travel and accommodation costs of the speakers. Teaching material of each workshop will be on sale. Teaching material for one workshop will be included in the workshop registration fee. The courses will be in parallel.

W1. **Respiratory muscles: an interesting approach to pulmonary diseases**
E. N. Bruce, Center for Biomedical Engineering, University of Kentucky (USA)
M. A. Mañanas, Biom. Eng. Research Center, Technical University of Catalunya, Spain

W2. **EMG and exercise physiology**
M. Minetto, Università di Torino, Italy A. Rainoldi, LISiN, Politecnico di Torino, Italy

W3. **Wearable/Ambulatory Technology and its applications**
P. Bonato, Movement Analysis Laboratory, Harvard University, Boston, USA.

W4. **Decomposition of the EMG signal**
C.J. De Luca, Neuromuscular Research Center, Boston, USA

W5. **Information extraction from surface EMG**
R. Enoka, University of Colorado, USA
D. Farina, Center for Sensory-Motor Interactions, Aalborg University, DK

W6. **Sensory -motor interaction and muscle pain**
Thomas Graven-Nielsen, Center for Sensory Motor Interaction, Aalborg University, DK

CONGRESS SCIENTIFIC TRACKS

T01. EMG modeling (D. Farina, D. Stegeman)
T02. EMG signal processing (T. Kiryu, P. Parker)
T03. Incontinence and pelvic floor EMG (P. Enck, R. Merletti)
T04. Gait and movement analysis (M.G. Benedetti, C. Frigo)
T05. Movement disorders (C. Disselhorst-Klug, W.S. Marras)
T06. Multichannel EMG and electrode arrays (G. Rau, M. Zwarts)
T07. Motor control (P. Hodges, M. Schieppati)
T08. Mechanomyogram (C. Orizio, T. Moritani)
T09. Motor units (R. Enoka, Z. Erim)
T10. Muscle fatigue (A. Rainoldi, S. Roy)
T11. Neurophysiology (M.J. Zwarts, A.J. Fuglevand)
T12. Physical Medicine and Rehabilitation (B. Arsenault, D. Falla)
T13. Posture (F. Benvenuti, J.J Carollo)
T14. Rehabilitation engineering (T.Sinkjaer, M. Solomonow)
T15. Sensor and wearable/ambulatory technology and applications (P. Bonato, D. De Rossi)
T16. Spasticity (A. Esquenazi, H. Hermens)
T17. Sports, elderly and space medicine and human performance (M. Narici, P. Tesch)
T18. Technology transfer (J. Wallace, V. Zolesi)
T19. Virtual and augmented reality in rehabilitation (P. Bonato, E. Keshner)
T20. Applications in ergonomics (H. Hermens, G. Sjøgaard)

DEADLINES
Abstract submission deadline:
December 15, 2005
Notification of acceptance:
February 15, 2006

COMMERCIAL EXHIBITION
Interested companies please contact Andrea Bottin (andrea.bottin@eln.polito.it)

Sponsoring Organisations Support for Congress Organisation has been provided by Camera di Commercio di Torino, Regione
Piemonte, Provincia and Città di Torino

CONFERENCE LANGUAGE
The official language of the conference is English

J. B A S M A J I A N L E C T U R E

Phil Parker, University of New Brunswick, Canada
Myoelectric control for powered prostheses: signal processing and applications

K E Y N O T E L E C T U R E S

Prof. Moshe Solomonow University of Colorado HSC Bioengineering Division, USA
The role of ligaments in motor control
Prof. Machiel J. Zwarts University Medical Center St. Radboud, The Netherlands
Clinical applications of surface EMG
Prof. Paul Enck University Hospital, Tuebingen, Germany
EMG of the pelvic floor muscles
Dr. Winfried Mayr Dept of Biomedical Engineering and Physics, University of Vienna
Novel emerging applications in Functional Electrical Stimulation
Dr. Francesco Felici IUSM, Roma, Italy
Neuromuscular responses to exercise investigated through EMG

The keynote lectures are expected to be published (if accepted after peer review) on a special issue of the Journal of Electromyography and Kinesiology

The European Society of Movement Analysis for Adults and Children (ESMAC)
&
The Gait and Clinical Movement Analysis Society (GCMAS)

invite you to attend the

1st Joint ESMAC - GCMAS Meeting (JEGM06)

Amsterdam, the Netherlands, September 28-30, 2006

Dear Colleague,

It is our pleasure to announce **JEGM06: the 1st Joint ESMAC & GCMAS Meeting** which will take place in Amsterdam, the Netherlands from September 28-30, 2006.

Clinical Gait and Movement Analysis is an interdisciplinary area, that attracts people from various scientific backgrounds, ranging from clinicians to engineers. The GCMAS (Gait and Clinical Movement Analysis Society) and ESMAC (European Society for Movement Analysis in Adults And Children) helped clinical movement analysis growing, over the last decades. In 2006 ESMAC and GCMAS will join their annual scientific meeting to be held in Amsterdam, and this meeting is called JEGM06. It will be preceded by seminars and a gait course.

Who should attend:

- orthopaedic surgeons, neurologists, pediatricians and rehabilitation physicians
- biomechanists, human movement scientists and biomechanical engineers
- kinesiologists, physical and occupational therapists
- students are encouraged by special lowrated student-fees.

So update your agenda and we look forward to welcoming you in Amsterdam next year.

With kind regards,

Scientific Board Chair: Roy Davis & Jaap Harlaar
Local Organising Committee: Jaap Harlaar & Caroline Doorenbosch

For more information: www.jegm06.org

5th World Congress of Biomechanics

Munich, July 29th - August 4th 2006

The Institut of Biotechnik e.V. together with the Technical University of Munich and Munich University of Applied Sciences cordially invite you to the 5th World Congress of Biomechanics 2006.

Biomechanics covers a wide field from solid to fluid mechanics, from motion sports mechanics to automobile crash tests. It includes tissue engineering and biomaterials, artificial organs and sports therapy.

At the 5th World Congress the newest experimental studies will be presented. Special emphasis will be placed on state-of-the art technology and medical applications. Only new, unpublished papers will be accepted.

The 5th World Congress of Biomechanics will explore topics of interest to:

- physicans
- bioengineers
- mechanical and aerospace engineers
- clinicians in cardiology and other cardiovascular specialties
- vascular surgeons
- radiologists
- neurologists and neurosurgeons
- orthopedic surgeons
- specialists in areas such as bone, ligaments, tissue mechanics, biologists, biochemists, biophysicists, biorheologists

Congress Chair:

Prof.Dr.-Ing.habil.
Dieter Liepsch

For more information: www.wcb2006.org

ISB MEMBERSHIP NEWS - New Members

Ms. Andrea Lay
Georgia Institute of Technology
780 Penn Ave, Apt B
Atlanta, GA 30308
United States of America

Mr. J. Keith Gulledge
Kinesiology
Indiana University
2036 N Walnut St
Bloomington, IN 47404
United States of America

Miss Katherine Blais
Invention Factory
The Timberland Company
8 Rasmussen Circle
Andover, MA 1810
United States of America

Mr. Jeremy Mogk
School of Kinesiology & Health Science
York University
4700 Keele Street
Toronto, Ontario M3J 1P3
Canada

Mr. Seungbum Koo
74 Barnes Court Apt. #618
Stanford, CA 94305
United States of America

Mrs. Nicola Wade
TippToes Ltd
Gooldscross
Cashel, Tipperary 0
Ireland

Ms. Inga Krauss
Medical Clinic, Department Sportsmedicine
Tuebingen, Germany
Bismarckstr. 26
Tuebingen, 72072
Germany

Mr. Philippe Favre
Biomechanics Laboratory, Department of Orthopedics
Balgrist, University of Zurich
Forchstrasse 340
Zurich, Zurich 8008
Switzerland

Ms. Sharna Clark-Donovan
Nike Sport Research Lab
Nike Inc.
One Bowerman Drive
Beaverton, OR 97006
United States of America

Mr. Cody Bliss
1365 West Calle Rancho Rio
Tucson, AZ 85714
United States of America

Ms. Sara Stabelfeldt
Kimberly-Clark Corp
2100 Winchester Road
Neenah, WI 54956
United States of America

Miss Samantha Reid
School of Physical & Health Education,
Kingston, ON K7L 3N6
Canada

Mr. Alexander Razzook
Physical Disabilities Branch
National Institutes of Health
9000 Rockville Pike
Bethesda, Maryland 20892-1604
United States of America

Miss Sylvana Garcia
Mechanical Engineering
University of Wisconsin - Madison
1019 Milton St. apt. 106
Madison, Wisconsin 53715
United States of America

Ms. Tiffany Edgecombe
Mechanical Engineering
University of Calgary
307 Strathcona Mews, S.W.
Calgary, AB T3H 1X4
Canada

Mr. Tim Bhatnagar
Biomedical Engineering
The University of Western Ontario
181 Castlegrove Blvd.
London, N6G 3T9
Canada

Mr. Andrew Sims
12/6 Taranto Rd
Marsfield, NSW 2122
Australia

Ms. Jennifer Yentes
California State University, Fullerton
1550 N Poinsettia Pl #301
Los Angeles, CA 90046
United States of America

Mr. Nels Johnson
1005 SE 15th Avenue #11
Minneapolis, MN 55414
United States of America

Mr. Deepesh Desai
Health and Human Performance
Auburn University
560 North Perry Street,
Auburn, Alabama 36830
United States of America

Dr. Kathy Browder
Health, Physical Education, Recreation, & Dance
University of Idaho
PEB 101
Moscow, Idaho 83871
United States of America

Mr. urs stöcker
laboratorium für biomechanik
eth zürich
hci e451
zürich, 8093
Switzerland

Dr. Bing-Shiang Yang
Sensory Motor Performance Program
Rehabilitation Institute of Chicago
and Northwestern University
345 E Superior St, Suite 1406
Chicago, Illinois 60611
United States of America

Mr. John Whitting
Biomedical Science
University of Wollongong
30 Waratah St
Windang, NSW 2528
Australia

Dr. Kornelia Kulig
Biokimesiology and Physical Therapy
University of Southern California
1540 East Alcazar Street, CHP-155
Los Angeles, CA 90089
United States of America

Dr. Cathy Holt
Cardiff School of Enigneering
Cardiff University
Queens Buildings, The Parade
Cardiff, Cardiff CF24 3BZ
United Kingdom

Mr. casey myers
Rehabilitation
North Valley Rehabilitation Hospital
1222 Vine st.
Aspen, CO 81611
United States of America

Mr. Vivek Pinto
Ergonomics and Biomechanics
New York University
1 Washington Square Village Apt. 13C
New York, PA 10012
United States of America

Mr. Kan Kuang Huei
P.O.Box 117-930
Taipei City 106, x
Taiwan

Dr. Svein Kleiven
CTV (Centrum för Teknik i Vården),
Neuronic Engineering
Royal Institute of Technology, KTH-South
Novum Research Park,
Huddinge, 141 57
Sweden

Ms. Kathleen Jagodnik
Department of Biomedical Engineering
Case Western Reserve University
9240 Winchester Valley
Chesterland, OH 44026
United States of America

Miss Gemma Whatling
Institute of Medical Engineering and Medical Physics
School of Engineering
Cardiff University
37 Monmouth Way
LLantwit Major, Vale of Glamorgan
CF61 2GT
United Kingdom

Mr. Benjamin Spurgeon
8 Astoria Crescent
Hull, HU8 9BJ
United Kingdom

Prof. Paul Dietl
General Physiology
University of Ulm
Kiechelweg 4
Ulm, Baden-Württemberg D-89077
Germany

Mr. Peter K. Larsen
Institute of Forensic Medicine
University of Copenhagen
Anthropological Laboratory
Copenhagen, DK-2200
Denmark

Dr. Gyusung Lee
Department of Surgery
University of Maryland
22 S. Greene St. Rm. S7B15
Baltimore, MD 21201
United States of America

Mr. EDEWOR NANA
NESAM CONCEPTS PT/REHAB.
752 SOUTHFIELD ROAD
LINCOLN PARK, MICHIGAN 48146
United States of America

Karl Stoffel
Alma Street 2
Fremantle, 6160
Australia

Mr Ali Tehrani Nasr
Dept. Of Orthotics & Prosthetics
University School of Social Welfare & Rehabilitation Sciences
Tehran
Iran

The International Society of Biomechanics Gratefully Acknowledges the Support of these Companies

MotionAnalysis™

3617 Westwind Blvd. Santa Rosa, CA, 95403 Tel: 707-579-6500 FAX 707-526-0629

VICONPEAK

VICON MX

Kistler Bio-mechanics Ltd.
Mill Lane, Alton, Hampshire GU34 2QJ, GB
Tel (0 14 20) 54 44 77
Fax (0 14 20) 54 44 74

KISTLER

Kistler Instrumente AG Winterthur
PO Box 304, CH-8408 Winterthur, Switzerland
Tel + 41 - 52-224 11 11, Fax 224 14 14
www.kistler.com/biomech