



International Society of Biomechanics Newsletter

ISSUE Number 102
June, 2007

ISB Officers

PRESIDENT

Dr. Brian L. Davis
Department of Biomedical Engineering
The Lerner Research Institute (ND 20)
The Cleveland Clinic Foundation
9500 Euclid Avenue
OH 44195, USA
Tel: 216 444 - 1055
Fax: 216 444 - 9198
E-mail: davisb3@ccf.org

PRESIDENT-ELECT

Dr. Walter Herzog
Faculty of Kinesiology
University of Calgary
2500 University Drive
Calgary, AB T2N 1N4
CANADA
Tel: (403) 220-8525
Fax: (403) 284-3553
E-mail: walter@kin.ucalgary.ca

PAST-PRESIDENT

Dr. Mary Rodgers
Dept. of Physical Therapy &
Rehabilitation Science
University of Maryland School of Medicine
100 Penn Street
Baltimore, MD 21201USA
Tel: (410) 706-5658
Fax: (410) 706-4903
E-mail: mrogers@umaryland.edu

SECRETARY-GENERAL

Dr. Julie R Steele
Department of Biomedical Science
University of Wollongong
Wollongong NSW 2522
AUSTRALIA
Tel: 61-(0)2-42213881
Fax: 61-(0)2-42214096
E-mail: julie_steele@uow.edu.au

TREASURER

Dr. Graeme A. Wood
PO Box 3156
Broadway
Nedlands, WA 6009
AUSTRALIA
Fax: 61-8-97 64 1643
E-mail: gwood@cygnus.uwa.edu.au

NEWSLETTER EDITOR

Dr. Karen Sjøgaard
National Institute of Occupational Health,
Lersø Parkallé 105
DK-2100 Copenhagen
DENMARK
Phone: +45 39 16 53 46
Fax: +45 39 16 52 01
Email: ks@ami.dk

TABLE OF CONTENTS

Underdog versus Top Dog	2
<i>Brian Davis, President</i>	
Evidence of the ISB work	3
<i>Luciano Menegaldo</i>	
Gait Analysis Teamwork in Melbourne	4
<i>Richard Baker</i>	
ISB 2007 Taipei update information	6
<i>Ty Shiang</i>	
The first Brazilian National Meeting on Biomechanical Engineering	7
<i>Estevam</i>	
Where are you on the science spectrum?	8
<i>Eric Sabo and Brian Davis</i>	
Summary of ISB Student Grant Program	9
<i>Ediuska Laurens</i>	
ISB Election Results	11
<i>Mary Rodgers</i>	
New Journal	11
<i>Yuli Toshev</i>	
Editors note	11
<i>Karen Sjøgaard</i>	
In memory of Kevin Granata	12
<i>Mark F. Abel</i>	
Advertisement	14
ISB Membership news	15
<i>Graeme Wood</i>	

AFFILIATE SOCIETIES OF ISB:

American Society of Biomechanics; Australian and New Zealand Society of Biomechanics; Brazilian Society of Biomechanics, British Association of Sport and Exercise Sciences; Bulgarian Society of Biomechanics; Canadian Society of Biomechanics/Société canadienne de biomécanique; Chinese Society of Sports Biomechanics; Comisia de Biomecanica Inginerie si Informatica (Romania); Czech Society of Biomechanics; International Society of Biomechanics in Sports, Japanese Society of Biomechanics; Korean Society of Sport Biomechanics; Polish Society of Biomechanics; Russian Society of Biomechanics; Société de biomécanique (France). Taiwanese Society of Biomechanics.

Underdog versus Top Dog

Brian L. Davis, Ph.D., ISB President

Since this is my last column as ISB president, I thought I'd focus on a topic that many of us can associate with. We all tend to cheer for the underdog, because everybody feels like that underdog at some stage of their career. The topic also relates to my desire – and the ISB's mission – to foster biomechanics in places around the world, even where this may be an uphill battle.

Who doesn't like to see an underdog rise up and overcome odds that make victory seem unlikely? I love watching sports and particularly to cheer the team least likely to triumph. I grew up in a sports-crazy country (South Africa) and now live in a sports-crazy city (Cleveland) where the teams always seem to be underdogs. Cleveland's basketball team (the Cavaliers, or "Cavs") are perennial "also-rans". They were formed in 1970 and were so bad they lost 36 of their first 39 games, were called "cadavers" by at least one reporter, and had facilities so bad that visiting players changed into their uniforms in a hotel across from the arena in suburban Richfield. Cavs players were even known to score in the wrong basket! However, in 1976, the team somehow made it to the playoffs and ended up defeating the Washington Bullets 4 games to 3 in a 7-game series, now memorialized as the "Miracle of Richfield." This story resurfaced this year because the Cavs – much to the surprise of the general public – made it to the NBA finals, only to lose (again!) to a much more experienced team from Texas.

On the golfing front, a definite "feel good" story is that pertaining to the Argentinian golfer Angel Cabrera. He defied the worst odds that Oakmont Country Club, the formidable Tiger Woods and other professional golfers could throw at him earlier this month to win the 2007 US Open. The 37-year-old former caddie from Cordoba was born in poverty and had his mother leave him when he was just 2 years old. His blue-collar background is reflected in his homemade swing, but his determined spirit finally paid off as he won a major golf tournament.

Switching to biomechanics: I asked a student in my department (Ediuska Laurens), who will be taking over from Cheryl Metcalf as ISB student representative, to go through old emails I have kept (from my prior roles as ISB newsletter editor and secretary-general). The goal was to determine which countries and laboratories were "top dogs" when it came to receiving ISB student grants. (See her report elsewhere in this newsletter). While Ediuska identified programs that have been very successful at encouraging students to apply for these grants, I would like to focus on places that are less successful. From my point of view, it is remarkable (and unfortunate) that, up until the most recent series of

funding, not a single student from Africa or South America had received a grant. Additionally, the number from Asia was extremely limited. I am hoping that the fact that 2007 saw the first grants awarded to students from Venezuela and Tanzania bodes well for the growth of biomechanics in these countries and that students from these parts of the world will no longer be perceived as "underdogs" as this program continues to grow.

Aside from the student grant program, there are other areas where I would like "underdogs" in the biomechanics community to rise to the forefront. I would like to see:

- Young students having the willingness to introduce themselves to long-time ISB members in Taipei this July. At my first ISB congress in Amsterdam in 1987, the only person I knew was my graduate advisor (Kit Vaughan). With this in mind, I forced myself to sit at a different lunch table each day, just so that I could get to know people within the society. The result was that I found people so welcoming, I have not missed an ISB congress since!
- More people attending the ISB congress in South Africa in 2009 than at any previous conference – although I suspect Kit Vaughan would NOT want this! ☺
- "Seed groups" in Croatia, Tanzania and Brazil becoming regular attendees at upcoming ISB congresses.
- A woman Muybridge winner – not because I think these awards should be artificially shared between the sexes, but rather because I would like to see women biomechanics researchers win the highest ISB award on their merits alone.
- A resurgence of the classic ISB "underdogs of all time," the Iliotibial Band! This group barely had time to practice together and yet, under the able direction of Martyn Shorten, turned in one of the most memorable ISB events, at the Rock and Roll Hall of Fame in Cleveland in 2005!

The ISB is a society where members can easily associate with the feelings of being "an underdog." I can certainly attest to this feeling: back when I stood in line to have Dr. Gerrit Jan van Ingen Schenau review my paper for the 1987 Congress proceedings, I had thoughts along the lines, "There is no way a man of his experience will accept my fledgling work." However, he did, and he was very encouraging in his remarks. I think this typifies the willingness of the ISB to "go the extra mile".

As my rewarding stewardship of this group comes to an end, I wish to thank all the members who have helped me as ISB President over the past 2 years. It has truly been a privilege to serve this society.

Brian L. Davis
ISB President 2005-2007

The image is a screenshot of the ENEBI 2007 website. At the top, it says 'ENEBI 2007 1º ENCONTRO NACIONAL DE ENGENHARIA BIOMECÂNICA' and '23 a 25 de maio – Petrópolis – Rio de Janeiro'. Below this, it says 'Terça, 22 de Maio de 2007'. On the left, there is a navigation menu with items: 'O ENEBI', 'Temas', 'Local e Data', 'Trabalhos', 'Organização', 'Programação', and 'Inscrições'. The main content area is titled 'Temas abordados' and lists various topics. Below this, the 'Premiação' section is highlighted with a red oval. It contains the text: 'Prêmio da International Society of Biomechanics' and 'A International Society of Biomechanics enviará um delegado para o Encontro, e conferirá um prêmio especial para o melhor pôster apresentado por estudante (pós ou graduação)'. On the right side, there are several logos, including ABEM, FINE, a circular logo, a globe logo, Ministério da Saúde, CAPES, abmec, and NEOORTHO.

Evidence of the ISB at work!

Loosely translated from Portuguese:

The International Society of Biomechanics will send a representative to the meeting, and will confer a special prize to the best poster presentation (after or graduation).

"Thank you very much for the wishes and the fantastic support from ISB. I think that for a 1st edition conference, ISB support and prize helped a lot to increase its credibility. We got about 50% more papers than we were expecting! We had about 120 papers, and I think that at least 100-110 will attend."

Luciano Menegaldo

Gait Analysis Teamwork in Melbourne, Australia



Richard Baker PhD CEng, CSci, Director, Gait CCRE www.mcri.edu.au/GaitCCRE

The Centre for Clinical Research Excellence in Clinical Gait Analysis and Gait Rehabilitation (Gait CCRE) brings together researchers from 6 different gait analysis laboratories within Melbourne. All have state of the art gait analysis systems and all have active clinical or clinical research activities.

A particular strength of the group is in the breadth of experience across different patient groups and different professional disciplines. The different centres include world leaders in research with children with cerebral palsy, injured athletes and older people with Parkinson disease, osteoarthritis or coping with the effects of stroke. The process of helping people improve their walking ability crosses many medical areas, with doctors, physiotherapists, prosthetists, orthotists and podiatrists all working together. The Gait CCRE aims both to improve the techniques used to make measurements and to apply these techniques to understand both our patient's problems and the potential of the different interventions we have to help them.

Our primary funding is a \$2 million, five-year grant from the National Health and Medical Research Council. We are now just over a third of the way through this funding programme.

The early months of the Gait CCRE focussed on establishing our operational structure and recruiting post-doctoral research fellows and doctoral students. The completion of this phase was symbolised by our formal launch in July 2005 by Federal Treasurer, the Hon. Peter Costello MP, and the Patron of the Murdoch Childrens Research Institute, Dame Elisabeth Murdoch AC DBE.

Assembling the team

Since the initial launch, the real work of conducting research, training researchers and ensuring that results are translated into clinical practice is well underway. A strong team of researchers has now been assembled, either directly funded from the CCRE grant or from

other funds that the Chief Investigators have won. We now have a team of nine post-doctoral research fellows and 14 doctoral students. This collaborative working relationship gives us the critical mass to do some really significant research. The quality of that research can be judged by the fact that we have had 73 papers fully published in peer reviewed journals in our first two years (excluding electronic publication).



Some of the team at the launch of our interim report, "Stepping Out"

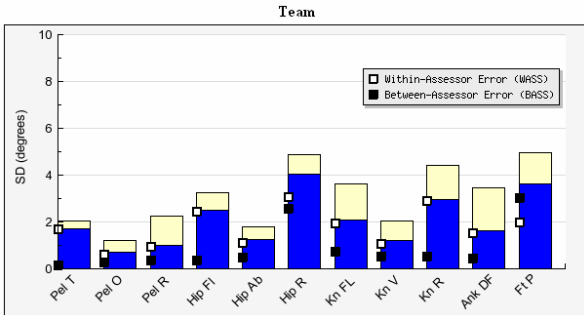
A winning record

We also have an excellent record in attracting grant funding. Significant grants include a Michael J Fox Foundation Clinical Discovery Grant (more than AU\$800,000), a project grant from the National Health and Medical Research Council (AU\$335,000), and others from the US National Parkinson Disease Association (more than AU\$100,000) and the Hugh Williamson Foundation (AU\$300,000). We have also negotiated research contracts with international companies Vicon and Allergan.

Methodological research

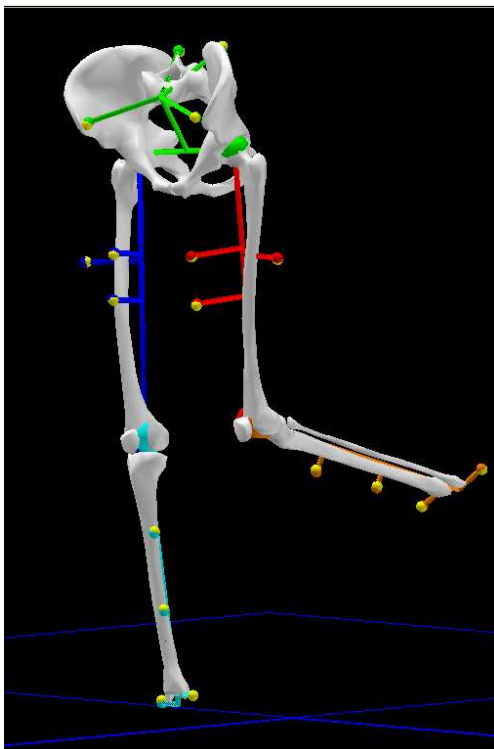
An important part of our activities is in core methodological research underpinning all gait analysis activity. Dr Jenny McGinley has developed new techniques for measuring and assuring the repeatability of gait analysis measurements which we call Gait Reliability Profil-

ing. Dr Oren Tirosh has developed a web-accessible data repository for gait analysis data. As well as serving as a platform for members of the Gait CCRE to share data, this is now freely available for others as well (<http://gaitabase.rch.org.au>). The latest development has been to incorporate Gait Reliability Profiling within this software.



Gait Reliability Profile within Gaitabase for a laboratory illustrating within and between assessor error and inter-trial variability for a range of gait measures

All working in gait analysis know how sensitive results are to the placement of markers and a further activity of the GaitCCRE has been in pioneering new models based on kinematic fitting and functional calibration to improve this. The first trial of these suggests that the new techniques give better reliability than our most experienced marker placers but are essentially independent of exactly where markers have been placed.



Using kinematic fitting to improve the reliability of gait analysis measurements

Spreading the word

The work of the CCRE has also been presented at conferences and other scientific meetings around the globe. Chief Investigators have given keynote

addresses at conferences in Piza, Salford (UK), Amsterdam, Kyoto, Utah, Washington DC, Kuala Lumpur, Buenos Aires, Auckland and Warsaw. At the Joint Meeting of the European Society for Movement Analysis in Adults and Children (ESMAC) and the Gait and Clinical Movement Analysis Society (GCMAS) in Amsterdam in September 2006, the team represented one keynote presentation, five podium presentations and six poster presentations. Richard Baker will be one of the keynote speakers at the next meeting of the International Society of Biomechanics in Taiwan in July.

Training for the future

The role in education and training of clinical researchers is a core component of the CCRE programme. All post-doctoral research fellows have access to our mentoring programme. The monthly Seminar Programme has had a total attendance of over 600 individuals. In December a two day course “Clinical Research Methodology in Gait Analysis” was oversubscribed with 42 delegates from across Australia and New Zealand.

Clinical Research Training Fellowships have so far given five clinicians the opportunity to be trained in clinical research methodology by undertaking small research projects supervised by the Chief Investigators. This programme is planned to expand significantly over coming years.

Research funding provided by



Australian Government

National Health and Medical Research Council

ISB 2007 Taipei update information

TY Shiang

ISB 2007 Taipei will be held in the Taipei International Convention Center, TICC, Taiwan. The convention center is up to date with all the modern conveniences with a business center, trade service center, congress service center and several food courts which are located in the world's tallest building - Taipei 101. And there are 15 keynote speakers, 460 oral presentations, 340 poster presentations and 4 satellite meetings presented at this conference. However, the most spectacular parts are the welcome party at the top of the world's tallest building Taipei 101 and the banquet that will be held in the National Palace Museum. Our goal for this conference is first it be an enjoyable one for all participants and second that the latest information in biomechanics can be shared and enlighten all who take part in the ISB2007.

There are a total of 30 countries confirmed that will attend ISB2007, and approximate 800 papers accepted. We estimate more than 1000 participants from around the world will attend this conference. A list of the current countries and accepted papers and will be attending below are listed below:

TICC & Taipei 101



National Palace Museum



- ✚ **Europe** : (Total 16 countries , 194 papers)
 - ✚ UK, 55 papers; Germany , 12 papers; Norway, 1 paper; Switzerland, 8 papers; Belgium, 19 papers; France, 15 papers; Italy, 17 papers; Ireland, 6 papers; Sweden, 2 papers; Spain, 3 papers; The Netherlands, 20 papers; Croatia, 3 papers; Denmark, 8 papers; Czech Republic, 19 papers; Finland, 6 papers; Turkey, 4 papers.
- ✚ **States** : (Total 2 countries , 142 papers)
 - ✚ USA , 105 papers ; Canada , 37 papers.
- ✚ **Oceania** : (Total 2 countries , 37 papers)
 - ✚ Australia, 33 papers; New Zealand, 4 papers.
- ✚ **Africa** : (1 country , 3 papers)
 - ✚ South Africa, 3 papers.

✚ **Asia** : (Total 9 countries , 321 papers)

- ✚ Taiwan, 179 papers; Japan, 85 papers; Korea, 17 papers; Hong Kung, 11 papers; Main China, 10 papers; Malaysia, 6 papers; Singapore, 6 papers; Thailand, 2 papers; Moscow, 1 paper.

The first Brazilian National Meeting on Biomechanical Engineering

Estevam

On the small town of Petrópolis, close to Rio de Janeiro, from May 23 to 25, the first Brazilian National Meeting on Biomechanical Engineering (www.dees.ufmg.br/enebi) was held, with around 120 participants, among engineers and health science researchers. The Meeting was sponsored by the Bio-engineering Committee of the Brazilian Society of Mechanical Sciences and Engineering, with the support of ISB and the Brazilian Association for Computational Methods. The purpose of the event was to provide a common forum for researchers of the area and to discuss their works and the insertion of Bio-

mechanics in the Brazilian political, scientific and social context. A prize was given by the ISB to Rafael Cobucci, from Federal University of Minas Gerais, for the best student presentation. Besides the Brazilian attendance, the Meeting also had the participation of researchers from Portugal, Cuba, United States, Venezuela, Spain and Argentina, interested in joint projects with the Brazilian community. The next Brazilian National Meeting on Biomechanical Engineering will be held in the first semester of 2009, in the coastal city of Florianópolis.



Rafael Cobucci receives from Dr. Paulo Fernandes (IST-Lisbon) ISB delegate the best student paper award



The MX+ camera range is the evolution of the highly successful and proven MX camera launched in 2004. This pioneering technology provides powerful grayscale processing, state-of-the-art optics and sensors as well as a highly efficient, ethernet-based PC connection.

Vicon offers a wide range of solutions available to meet your application and budget needs.

For more information, please visit www.vicon.com or e-mail sales@vicon.com.

For the UK and International:

Vicon Motion Systems Ltd.

14 Minns Business Park
West Way
Oxford, OX2 0JB, UK

Tel: +44 (0)1865 261800

Fax: +44 (0)1865 240527

For North & South America:

Vicon Motion Systems Inc.

9 Spectrum Pointe
Lake Forest
CA 92630, USA

Tel: +1 949 472 9140

Fax: +1 949 472 9136

Where are you on the science spectrum?

Eric Sabo and Brian Davis

Cleveland Clinic

Take this short, fun quiz to see where you fall on the science spectrum. Match each quantity for questions 1-26 with the appropriate description on the right. You will find the applicable units for each numerical quantity in parentheses.

- | | | |
|-----------------------------|-------|--------------------------------------------------------------------------|
| 1. 7.40 | _____ | a. Avg. intake (and output) of water in an adult human (mL/day) |
| 2. 9.81 | _____ | b. Universal gas constant, R (J/mol-K) |
| 3. 206 | _____ | c. Pi, π |
| 4. 746 | _____ | d. Gravitational acceleration, g (m/s ²) |
| 5. 5.0 | _____ | e. Estimated number of genes in the human genome |
| 6. 6.63×10^{-34} | _____ | f. The number of Watts (W) in one horsepower (hp) |
| 7. 100 trillion | _____ | g. Avogadro's number |
| 8. 3.14 | _____ | h. Avg. volume of blood in an adult human (L) |
| 9. 98.6, 37.0 | _____ | i. The mathematical constant, e |
| 10. 8.31 | _____ | j. Resting membrane potential of large nerve fibers (mV) |
| 11. 7.8 | _____ | k. Planck's Constant (m ² -kg/s) |
| 12. 2.718 | _____ | l. Speed of light in a vacuum (m/s) |
| 13. 120/80 | _____ | m. Avg. human blood pressure (mm Hg) |
| 14. 6.02×10^{23} | _____ | n. Magnetic permeability constant, μ_0 (H/m) |
| 15. -90 | _____ | o. Elementary charge (C) |
| 16. 1.602×10^{-19} | _____ | p. Avg. healthy human body temperature (⁰ F, ⁰ C) |
| 17. 2,300 | _____ | q. Avg. diameter of a red blood cell (μm) |
| 18. $4\pi \times 10^{-7}$ | _____ | r. Average pH of human blood |
| 19. 30,000 | _____ | s. The number of bones in the human body |
| 20. 3.0×10^8 | _____ | t. Estimated number of cells in an adult human body |
| 21. 120 | _____ | u. The number of pounds in one kilogram |
| 22. 0.5 | _____ | v. Avg. (normal) blood glucose concentration in blood (mmol/L) |
| 23. 4.0 to 8.0 | _____ | w. The number of kilobytes (KB) in one megabyte (MB) |
| 24. 2.20 | _____ | x. Avg. lifespan of a red blood cell (days) |
| 25. 137 to 146 | _____ | y. Avg. (normal) serum sodium concentration in blood (mmol/L) |
| 26. 1,024 | _____ | z. The sine of 30 degrees |

Answers:

- | | | | | | | | | | |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 1. r | 2. d | 3. s | 4. f | 5. h | 6. k | 7. t | 8. c | 9. p | 10. b |
| 11. q | 12. i | 13. m | 14. g | 15. j | 16. o | 17. a | 18. n | 19. e | 20. l |
| 21. x | 22. z | 23. v | 24. u | 25. y | 26. w | | | | |

Scoring:

Give yourself +1 point for each correct answer to even-numbered questions.

Give yourself -1 point for each correct answer to odd-numbered questions.

Your score _____

Note: A positive score reflects physics/engineering knowledge and a negative score is indicative of anatomy/physiology knowledge.

Scale:

-13 to -10: Danger! Human anatomy and physiology knowledge overflow!

-9 to -5: Come on, math isn't *that* scary.

-4 to 4: Your diverse knowledge would serve you well on Jeopardy!

5 to 9: A friendly suggestion: Limit your wardrobe to *one* pocket protector...

10 to 13: Please put down the slide rule and slowly back away.

Summary of ISB Student Grant Program

Ediuska Laurens, Ph.D. candidate,
Cleveland State University/Cleveland Clinic

As a new member of the ISB executive council, and a grateful recipient of an ISB Congress grant, I was interested in the history of ISB student grants. Specifically:

- Universities and Institutions receiving the most grants,
- Number of applicants
- Grants awarded (Dissertation, Congress, and International Travel), and finally
- The world distribution of these awards.

This information is important in order to determine whether there is a worldwide student grant allocation

and whether international students are taking advantage of the program.

With extensive help of the current ISB president Dr. Brian Davis, I was able to “play CIA agent” and get a hold of student grant reports that dated back to 1998 as well as the latest 2007. After a widespread analysis of this data, the top ten universities receiving the most student awards were identified (**Table 1**). These institutions were selected based on the number of dissertation, congress travel, and international travel grants awarded since 1998 through 2007.

Table 1. Top Ten Universities with the most Awardees.

Universities	Number of Awardees
University of Calgary	13
Pennsylvania State University	10
ETH Zurich	8
University of Massachusetts	7
University of Maryland	6
Drexel University	6
University of Wollongong	6
University of Oregon	5
University of Western Australia	5
University of South California	4

As mentioned before, another objective of this investigation was to verify the number of applicants and awards offered throughout the past decade. Although we were able to obtain the number of awards granted from 1998 to 2007, the number of applicants was only available for certain years. Therefore, we were suc-

cessful in accomplishing this goal just for the years 1998, 1999, 2004, 2006, and 2007. The outcome is shown in **Table 2**.

Table 2. Dissertation, Congress, and International Travel Grants awarded, 1988-2007.

Year	Dissertation Grant	Congress Travel Grant	International Travel Grant	Overall Funded (awardees/applicants)
1998	2	N/A	4	6/6
1999	4	10	2	16/20
2000	10	N/A	4	14/UNKN
2001	6	16	4	26/UNKN
2002	10	N/A	6	15/UNKN
2003	6	24	0	30/UNKN
2004	8	N/A	7	15/20
2005	8	16	3	27/UNKN
2006	13	N/A	6	10/19
2007	7	12	3	20/32

N/A = ISB Congress is held every other year.
UNKN = the number of applicants is unknown.

Even though information is missing for four other years, this record demonstrates that the number of applicants has increased since 1998 when the student awards were first presented.

Lastly, a world map is being introduced to illustrate the countries with the highest and lowest number of awardees since the year 1998 to current (Figure 1). Once again, the number of awardees per year accounts for the three ISB student grants.

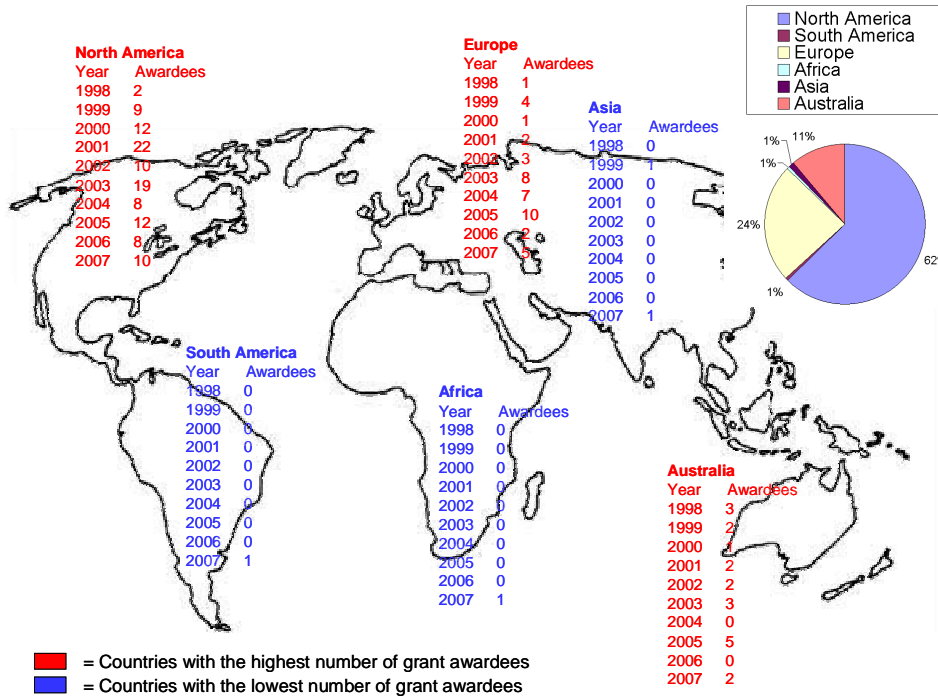


Figure 1. Student Grants Awarded based on Countries around the Globe, 1998 to 2007.

This figure easily identifies which countries receive the most student awards. The summary comprises North America with 62%, Europe 24%, followed by Australia 11% and at the very bottom Africa, Asia, and South America with 1% each.

Conclusively, this study has provided me with a great introduction to ISB and with a constructive learning experience. It is gratifying to know that the number of students applying for ISB grants has increased during the years, meaning that ISB has been able to reach out more students during this time. Simultaneously, it is impossible not to point out that there is an unbalance in the way the student grants are distributed around the world. Developed countries seems to be taken full

benefit of this funding, while third world countries are almost absent in participation and probably having the highest number of students who surely need of such financial support.

Since the student grants are available to every single student worldwide, this is not a matter of ISB having a preference for students from certain part of the globe. This is more a matter of making a better effort to reach those students located in places where information about these opportunities are harder to discover. Therefore, the endeavor is on the hands of all the ISB members, especially those who reside in EDC countries to convey this message to students.

ISB Election Results

Mary Rodgers

I am pleased to announce the ISB election results:

Julie Steele is the President-elect

Student representative is Ediuska Laurens

Council members are John Challis, Andrew Cresswell, Robert van Deursen, Veronique Feipel, Krystyna Gielo-Perczak, Joe Hamill, Frans van der Helm, Peter Milburn, Tzyy-Yuang Shiang, and Karen Sogaard.

Congratulations to the new council members!

New Journal

Prof. Yuli Toshev

Dear Colleagues,

It is my pleasure to announce the coming (June/July 2007) new quarterly peer-reviewed Journal "Series on Biomechanics", edited by the Bulgarian Academy of Sciences and the Bulgarian Society of Biomechanics. The journal is the successor of the Journal "Biomechanics Series", edited by the Bulgarian Academy of Sciences in the period from 1974 to 1995.

You are kindly invited to visit our site www.biomechanics-bg.org and using the link "Journal Information/Submission Guideline" to submit your paper.

In our site you can find information about the history of the biomechanics in Bulgaria, the Bulgarian Society of Biomechanics, links to journals, societies, events etc.

Hoping that you will submit some of your papers to the Journal "Series on Biomechanics", Best wishes

Prof. Yuli Toshev
President of the Bulgarian Society of Biomechanics
Editor-in-Chief of "Series on Biomechanics"

Editors note

Karen Sogaard

Now ISB 2007 is just around the corner. By the way, get inspired by reading the latest update from the organizers. This event also means that the yearly ISB-council meeting is approaching and I have recently sent in my report for the Newsletter. Basically, there is not much to tell, the electronics version now makes things much easier and there is no page limit any longer. So really there is room for all the contributions that you, the readers, would like to share with other ISB's. In this issue get inspired by the description of the gait lab in Melbourne, why not describe your lab?

Or see the newly elected student representative, Eduska Lauren's analysis of the distribution of the ISB student grants since 1998. Comments or suggestions on this important issue for our society would be welcome.

Deadline for the next issue is end of August.
Looking forward to hearing from you.

Karen Sogaard,
Newsletter editor.

In Memory of Kevin Granata

Mark F. Abel, M.D.

Below is a memorial and summary of Dr. Kevin Granata's life's work. It was written by one of his close friends and collaborators, Dr. Mark Abel, who is a professor of Orthopaedics here at the University of Virginia.

On April 16, 2007 a gunman killed 33 students and faculty on the campus of Virginia Tech. One of those killed was Dr. Kevin P. Granata, an engineer scientist who worked with me for 6 years at the University of Virginia. Kevin's last post was Norris Hall at Virginia Tech but his legacy lives on. My intent is to leave grief behind and focus on the important contributions and life of Dr. Kevin Granata.

Like most successful people, Kevin Granata was determined, tough, disciplined and highly educated. His Ohio upbringing included farm work, carpentry, athletics and of course academics. Clearly self-sufficiency and the acquisition of a broad knowledge base were the themes stressed at home and that made him unique in his professional life. Although based in engineering science, his interests ultimately gravitated to 'motor control' and his discoveries were in ergonomics, neurology and sports medicine. However, Kevin never lost focus of the big picture; he was the consummate educator and family man.

Dr. Granata received a B.S. in Engineering Science from Ohio State, and then pursued a Master's in Physics at Purdue University. In addition to his academics endeavors, Kevin found time to be on the crew team and to meet his wife, Linda, at Purdue. Kevin worked for the Navy in submarine technology through the Johns Hopkins Applied Physiology Laboratory. One of his first publications dealt with measurements of low level noise coming from ships. In 1989, he returned to Ohio State University to acquire a PhD in biomechanics. Ultimately this took him to Dr. William Marras and the Biodynamics Laboratory where Dr. Granata worked to define and measure reflex responses to loads and the relationship to trunk stability. This work was important in helping to understand causes and prevention of back injury in the work place. The hope was that deficiencies in trunk reflex responses to load could be identified and that training programs and/or braces prescribed to correct the deficits and prevent injury. Dr. Granata received several federally funded grants for this work and he continued this line of investigation to the day of his death.

In 1997, after his post-doctoral work, he was recruited by the Department of Orthopaedic Surgery of the University of Virginia to be the Research Director of the Motion Analysis and Motor Performance Laboratory. He held a joint appointment in Biomedical Engineering. He focused his keen mind on expanding his research in human movement to understand how brain injury for children with cerebral palsy interfered with balance and movement. He worked with me and Diane Damiano, PhD (now at Washington University, St. Louis) to understand ankle and knee coupling in cerebral palsy and in determining ways to quantify threshold joint velocities during spastic gait. The importance of this work was to allowed us to quantify specific control deficits and then to see if treatments altered them. We evaluated the impact of muscle-tendon surgery and the neurosurgical procedure popular at the time, selective dorsal rhizotomy.

During his six years at University of Virginia (UVA), he published extensively on movement dynamics, joint stability and relationship to injury as well as adaptations to spastic movement constraints. His successes in research and teaching quickly brought him tenure. He was an outstanding resource for graduate students in mechanics, bioengineering, sports medicine and orthopaedics. Dr. Granata's research vision was to develop a center to study the essence of human movement and how machines, braces and walking devices could be developed to overcome human disability. In 2003, he started the Musculoskeletal Biomechanics lab at Virginia Tech where he held the rank of Professor of Engineering Science & Mechanics at the time of his death. At Virginia Tech, Dr. Granata resumed work on the dynamics of body trunk stability and the influence of walking speed on trunk stability. Dr. Granata was recognized as a top notch academic scientist at the University of Virginia and Virginia Tech. His broad educational experience and extremely logical and insightful approach made him a popular research collaborator. Indeed he fostered inter-institutional research with both University of Virginia and several other universities across the country. He was a leader in the American Society of Biomechanics and also active in the American Society of Mechanical Engineering, the Gait and Clinical Movement Society and Human Factors, and the Ergonomics Society. He was also associate editor of the Journal of Applied Biomechanics and the Journal of Electromyography and Kinesiology.

All that knew Kevin Granata can attest to his keen mind and practical approach to scientist. Research and life are both approached through incremental stages in which we strive to advance knowledge. No one would argue that Dr. Granata was on an upward trajectory of sequential improvements and advancements in both areas. His contributions include not only the 50 plus articles in the literature but also the many students he

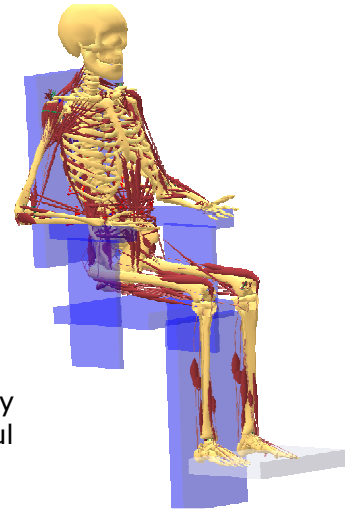
mentored have moved on to influence others. Of course he also has his family including his wife Linda and their 3 beautiful and bright children to round out a wonderful and perpetual legacy of his life's work.

Alfred R. Shands, Jr. Professor Orthopaedic Surgery & Pediatrics Director, Motion Analysis & Motor Performance Laboratory The University of Virginia



A trust fund controlled by his family, which will contribute to the support of his wife and three children, has been established in honor of Dr. Granata. Contributions can be made to Kevin P. Granata Memorial Trust, 1872 Pratt Drive Suite 1125, Blacksburg, VA 24060.

ANYBODY TECHNOLOGY

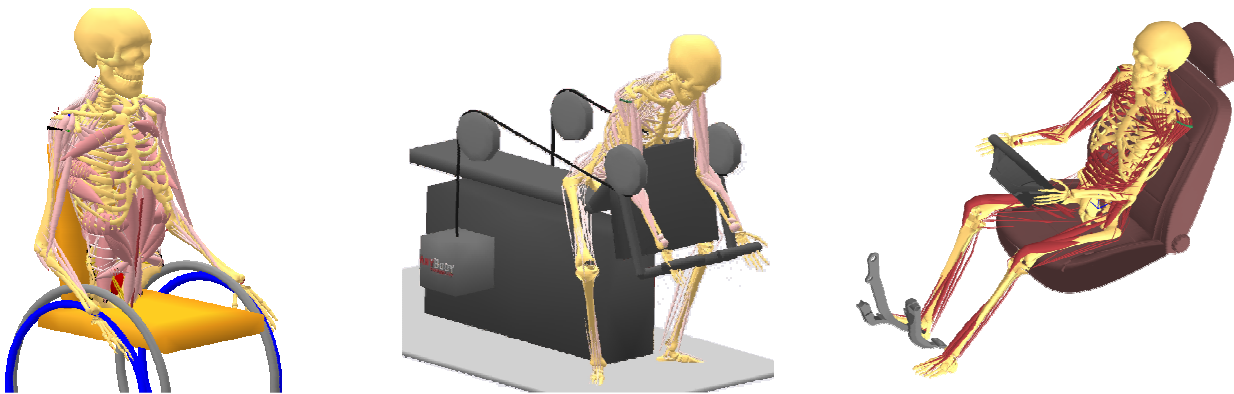


AnyBody is a software system for modeling the mechanics of the human body.

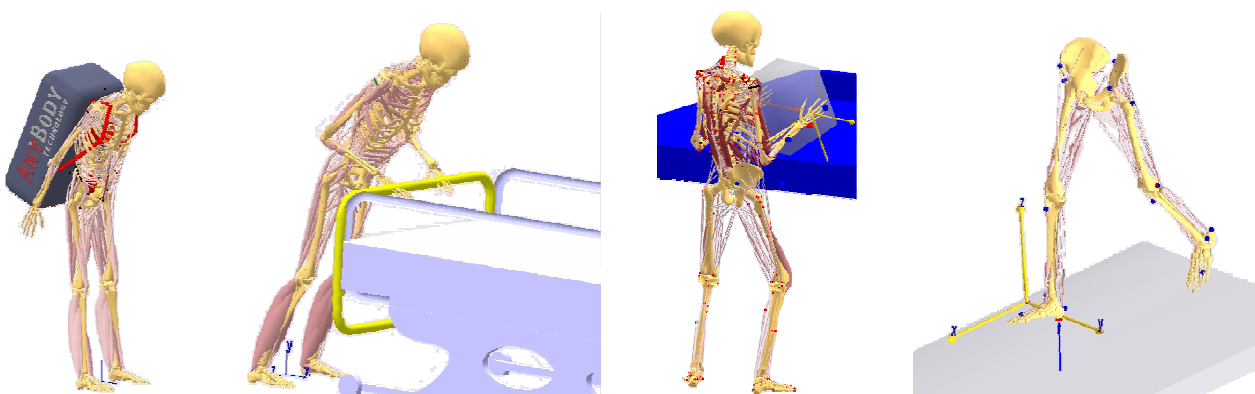
It computes forces in individual muscles, joint forces, elastic energy in tendons, antagonistic muscle actions, and many other useful properties of the working human body.

Using standard inverse and inverse-inverse dynamics AnyBody can handle models with hundreds of muscles on ordinary personal computers. This ability alone makes AnyBody unique.

AnyBody models not just the body, but also the objects it interfaces to; the seat and the crank mechanism of a bicycle, the backrest and foot support of a chair, the steering wheel and gearshift of a car. With AnyBody, you can investigate in detail the ergonomic consequences of design parameters.



Free demo licenses are available. Demo licenses have full functionality but a limited duration. For more information, please visit www.anybodytech.com or email anybody@anybody.com.



AnyBody Technology A/S • Niels Jernes Vej 10 • DK-9220 Aalborg East • Denmark
Tel: +45 9635 4286 • Fax: +45 9635 4599

ISB MEMBERSHIP NEWS - New Members

Barbara May
60 Rigby Lane
Bromsgrove, Worcestershire B60
2EW
United Kingdom

Felipe Carpes
Ferreira Viana, 865/308
Porto Alegre, RS 90670-100
Brazil

Lydia Yahia Cherif
11 place marcelin berthelot
Paris, IDF 75015
France

Wei-Hua Ho
No.101, Sec. 2, Jhong-Cheng Road,
Taipei, Taipei 11148
Taiwan

Carsten Moelgaard
kronosvej 155
Aalborg, Denmark 9210
Denmark

Robert Gillette
Veterinary Sports Medicine
Program, 100 McAdory Hall,
College of Vet Med
Auburn University, Alabama 36849
United States

Mozammil Hussain
Deptt of Research, 1851 Schoettler
Rd
Chesterfield, Missouri 63017
United States

Gregory King
Civil and Mechanical Engineering;
5100 Rockhill Road
Kansas City, MO 64110
United States

Michael Cole
Institute of Health and Biomedical
Innovation
Queensland University of
Technology
18 Pfeiffer Place
McDowall, Queensland 4053
Australia

Nisim Benjuya
13-B Hatamar St.
Kfar-Saba, 44508
Israel

Takaaki Nakamata
1001-1 Kishioka
Suzuki-city, Mie, 510-0293
Japan

Hiroaki Hobara
Area B-108, 2-579-15, Mikajima
Tokorozawa, Saitama 359-1192
Japan

Tom Franz
Cardiovascular Research Unit, Fac
of Health Sciences, University of
Cape Town, Private Bag X3
Observatory, Western Cape 7935
South Africa

Deborah Vickers
17 Howden St
Holsworthy, NSW 2173
Australia

Masaki Ishikawa
Rautpohjankatu 8
Jyväskylä;
Jyväskylä; 40014
Finland

Caleb Wegener
10/9 Meadow Cr
Meadowbank, 2114
Australia

Craig Tanner
PO Box 23812
Doha, 0
Qatar

STEVEN WIKER
PO BOX 6070
MORGANTOWN, WV 26506
United States

Philip Oris
D6-03 Phileo Damansara No 9 Jlm
16/11
Petaling Jaya - Selangor, 46350
Malaysia

Michelle Lacki
Footwear
Brooks Sports
19910 North Creek Parkway, Suite
200
Bothell, Washington 98011
United States

Erika Nelson-Wong
90 Brock Street
Kitchener, ON N2M 1X3
Canada

Christopher Thom
188 Erb St. W
Waterloo, ON N2L1V3
Canada

Pattama Rittruechai
The Royal Veterinary College,
Structure and Motion Lab,
Hawshead Lane
North Mymms, Hatfield,
Hertfordshire AL9 7TA
United Kingdom

Chris Winby
4 Lovegrove Close, Mount
Claremont
Perth, Western Australia 6010
Australia

Jessica Seater
Human Movement and Sports
Sciences
University of Ballarat
5 Madison Crt
Ballarat, Victoria 3350
Australia

Robert Kirk
39 Blakeney Road
Sheffield, South Yorkshire S10 1FD
United Kingdom

Gwang Moon Eom
322 Danwol-dong
Choonju, Choonbuk 380-701
Korea, Republic of

Thorsten Sterzing
Lohrstr. 42
Chemnitz, Sachsen 9113
Germany

Gye-Rae Tack
Biomedical Eng. Konkuk Univ. 322
Danwoldong
Chungju, Chungbuk 380-701
Korea, Republic of

Li Zhang
1287 Joseph Drouin Ave.
Ottawa, Ontario K1C 7B1
Canada

Yoshi Mochizuki
5201 Great America Parkway, Suite
320
Santa Clara, CA 95054
United States

Yi-Xian Qin
Dept of Biomedical Eng, Stony
Brook University
Stony Brook, New York 11784-
2580
United States

Hugh Sheridan
6 Hillside Drive
Liverpool, Merseyside L25 5NS
United Kingdom

Scott Landry
12454 Coventry Hills Way NE
Calgary, AB T3K 4T1
Canada

Peter Federolf
HPL
University of Calgary
314 Garrison Square SW.
Calgary, Alberta T2T 6B3
Canada

Kenneth Meijer
Movement Sciences, Faculty of
Health, Medicine and Life Sciences
Maastricht University
Universiteitssingel 50
Maastricht, Limburg 6229 ER
Netherlands

annika martin
17 bury house
worthing, west sussex BN14 9AG
United Kingdom

Joel Lanovaz
87 Campus Drive
Saskatoon, Saskatchewan S7N 5B2
Canada

Richard Lauer
Research
Shriners Hospitals for Children
3551 North Broad Street
Philadelphia, PA 19140
United States

Yue Li
180 Elm Street
Toronto, Ontario M5T 3M4
Canada

Valerie PAZOS
5179 Henri Julien
Montreal, Quebec H2T 2E6
Canada

Liang-Ching Tsai
402 S. Garfield Ave Apt 24
Alhambra, California 91801
United States

Evgenij Bobrowitsch
Wilhelmstr. 26
Neu-Ulm, Bayern 89231
Germany

Kieran Moran
1 Brodir Row, Palatine Square
Dublin, Dublin Dublin 9
Ireland

Tilak Dutta
550 University Ave, #12029
Toronto, ON M5G 2A2
Canada

Judith Visser
28 Knolles Crescent
North Mymms, Hertfordshire AL9
7EA
United Kingdom

Rosemary UNING
Department of Biomedical
Engineering
University of Malaya
Department of Biomedical
Engineering, Faculty of Engineering
Kuala Lumpur, Federal Territory
50603
Malaysia

Subash Mannanal
446 Apt.A, Allyn Street
Akron, Ohio 44304
United States

Jennifer Neugebauer
1010 Drake Dr
Davis, CA 95616
United States

Johan Molenbroek
Industrial Design Engineering
Delft University of Technology
landbergstraat 15
delft, zh 2622CE
Netherlands

I-Lin Wang
250, Wen Hua 1st Rd., Kueishan,
Taoyuan County
Taiwan, Republic of China. 11091
Taiwan

Toshiyuki Kurihara
Nakano 1-22-8, Nakano-ku
Tokyo, Tokyo 164-0001
Japan

Gaspar Morey Klapsing
Vial-1, 4
Esporles, Balearic Islands 7190
Spain

Yiorgos Papaioannou
4058 N.Downer Ave
Shorewood, WI 53211
United States

Daniel Shope
20750 Path Valley Road
Dry Run, PA 17220
United States

Trisha Kesar
301 Mckinly Laboratory,
Department of Physical Therapy,
University of Delaware
Newark, Delaware 19702
United States

James Bagley
1973 Fixlini St.
san luis obispo, CA 93401
United States

Kevin Shelburne
945 Meadow Run
Golden, Colorado 80403
United States

Daniel Peterson
245 Ghaner Dr.
State College, PA 16803
United States

Nils Hakansson
434 University Avenue
Davis, CA 95616
United States

Herman van Werkhoven
Department of Kinesiology
Penn State University
710 Toftrees Ave
State College, PA 16803
United States

Colin Davenport
Hardwick Farm
Hardwick Lane, Ashover S45 0DE
United Kingdom

BEN GREASLEY
4 SALISBURY ST
KETTERING, NORTHANTS
NN16 9LN
United Kingdom

Katherine Holzbour
1729 Woodland Ave Apt L
East Palo Alto, CA 94303
United States

Saeed Forghany
Centre for Rehabilitation and
Human Performance Research
Salford University
PO23-Brian blatchford building-
Freidrick road campus-Salford
University
Salford, Lancashire m6 6pu
United Kingdom

Syh-Shiuh Yeh
No. 1, Sec. 3, Chung-Hsiao E. Rd.,
Taipei 10608
Taipei, Taiwan 10608
Taiwan

Matt McCallister
6326 7th unit 2
Lubbock, TX 79416
United States

matt brughelli
27A Widgeon CL
Perth - Stirling, WA 6021
Australia

Dinant Kistemaker
Noordzijde 309
Amsterdam, NH 1064MG
Netherlands

Seigo Nakaya
2-1, 6-Chome, Takatsukadai, Nishi-
ku
Kobe, Hyogo 651-2271
Japan

Kenta Moriyasu
2-1, 6-Chome, Takatsukadai, Nishi-
ku
kobe, hyogo 651-2271
Japan

Deva Chan
603 Lessley Pl
Davis, CA 95616
United States

Rami Korhonen
#2-6A Parkdale Cres NW
Calgary, Alberta T2N 3T8
Canada

Aurel Coza
Human Performance Laboratory
University of Calgary
C129, 1903, 8Ave, NE
Calgary, Alberta T2E-0T3
Canada

Ender Finol
Carnegie Mellon University, 5000
Forbes Ave., HbH 1205
Pittsburgh, PA 15213
United States

Maarten Oosterlinck
Faculty of Veterinary Medicine,
department of Surgery and
Anesthaesiology
Ghent University
Salisbury lane 133
Merelbeke, Oost-Vlaanderen B-
9820
Belgium

Yasuhiko Hatanaka
1001-1 Kishioka
Suzuka, Mie 510-0293
Japan

LINDA KENT
2004 LONGVIEW COURT
PENNSBURG, PA 18073
United States

Bret Hudson
388 Manchester St. #3
Manchester, NH 3103
United States

Bing Yu
1315 Autumn Ridge Dr
Durham, NC 27712
United States

William Brent Edwards
232 South Walnut Ave #7
Ames, IA 50010
United States

milad masjedi
5, parish view, 19 pudding chare
Newcastle upon Tyne,
Northumberland NE1 1UD
United Kingdom

Super Admin
testtest
testtest, MA testtest
Australia

jonathan loh
4-20 manseau av
montreal, PQ H2V 4T1
Canada

Irene Di Giulio
3, Chapel Street
Crewe, Cheshire CW2 7DQ
United Kingdom

George Beneck
10846 Walnut St
Los Alamitos, CA 90720
United States

Alison Novak
Queen's University
Kingston, Ontario K7L 3N6
Canada

prakriti parijat
305 huntclub road, apt 6600C
blacksburg, VA 24060
United States

D Travis McMaster
5512 St. Johns Sd.
Stouffville, Ontario L4A 7X4
Canada

Serge VAN SINT JAN
Lennik Street 808 (CP 619)
Brussel, Brussel 1070
Belgium

Luci Teixeira-Salmela
Rua Capri, 480 - Bandeirantes
Belo Horizonte, Minas Gerais
31340-440
Brazil

Amin Kashanchi
5/148 , Pacific Highway , Roseville
Sydney, NSW NSW 2069
Australia

Janie Astephen
1663 Brunswick St. - Apt. 207
Halifax, Nova Scotia B3J 3Z6
Canada

abbie Ferris
117 S. Avenue 64 # 211
Los Angeles, Ca 90042
United States

Roza Mahmoodian
1736 Earlington Rd.
Havertown, PA 19083
United States

Shirley Rietdyk
800 W. Stadium Ave.
West Lafayette, IN 47907-2046
United States

pierfrancesco celada
mundella terrace 29
newcastle, england NE6 5hX
United Kingdom

Lars Andersen
Lersø Parkalle 105
Copenhagen Ø, Copenhagen 2100
Denmark

Brandie Dunn
Box 394
Coalhurst, TOL 0V0
Canada

Wei-Li Hsu
R301 Mckinly Lab
Newark, 19716
United States

Travis Burgers
3549 Heather Crest
Madison, 53705
United States

Stefan van Drongelen
Biomedical Rehabilitation Sciences
& Engineering
Swiss Paraplegic Research
Swiss Paraplegic Research
Nottwil, CH 6207
Switzerland

Rajesh Paranjape
1049 west 49th st apt#310
Norfolk, VA 23508
United States

Dustin Hatfield
Kinesiology and Health Promotion
University of Kentucky
183 Transcript Ave #9
Lexington, Kentucky 40508
United States

Feng Yang
1919 W. Taylor St. MC898
Chicago, 60612
United States

guan tan
205 washington ave #5
ames, 50010
United States

Sohit Karol
Department of Kinesiology,
University of Maryland
College Park, 20742
United States

Ann Simon
Biomedical Engineering
University of Michigan
1206A CCRB
Ann Arbor, MI 48109-2214
United States

Stephen Ferguson
University of Bern,
Stauffacherstrasse 78
Bern, CH-3014
Switzerland

Janet (Jing) Han
Systems Design Engineering
University of Waterloo
3379 Erin Center Blvd.
Mississauga, Ontario L5M 8C4
Canada

Kurt Beschorner
984 Greenfield Ave
Pittsburgh, 15217
United States

Aviv Fried
104, 1040 15 Ave SW
Calgary, T2R 0S6
Canada

Rebecca Bolt
One Bowerman Drive
Beaverton, 97005
United States

Dimitra Blana
Biomedical Engineering
Case Wester Reserve University
955 W. St. Clair Ave Apt. 1606
Cleveland, OH 44113
United States

Noor Azuan Abu Osman
Department of Biomedical
Engineering, Faculty of Engineering
University of Malaya
Department of Biomedical
Engineering, Faculty of
Engineering, University of Malaya
Kuala Lumpur, Wilayah Persekutuan
50603
Malaysia

Yeow Chen Hua
Blk 244, Yishun Ring Road, #02-
1135
Singapore, 760244
Singapore

Romain DENIS
10 Bridge road
Uxbridge, UB8 2QN
United Kingdom

Matthew Brodie
4-15 Claremont Grove
Mt Vic, Wellington, 0
New Zealand

Dominic Thewlis
Department of Allied Health
Professions
University of Central Lancashire
apt 64, centenary Mill
Preston, Lancashire PR1 5JQ
United Kingdom

Kane Middleton
15A Wardle Road
Perth, 6162
Australia

Jerome SAURET
Faculty of health and social care
University of gloucestershire
22 Saint Paul Street North
cheltenham, Gloucestershire GL50
4AQ
United Kingdom

Rachel Wright
33 Rona Gardens
Worcester, WR5 3UH
United Kingdom

Steven Cusick
191 Spring Street
Lexington, 1540
United States

Matt Clerc
191 Spring St.
Lexington, 2420
United States

Leonidas Spyrou
Mechanical & Industrial
Engineering
University of Thessaly
Pedion Areos
Volos, Thessaly 38334
Greece

David Frost
50 Emerald Way
Edgewater, 6027
Australia

Nelson Cortes
Human Movement Science
Old Dominion University
237 Granby St., APT#35
Norfolk, Virginia 23510
United States

Ryan Chang
Kinesiology
University of Massachusetts
30 Eastman Lane, Totman 110
Amherst, MA 1003
United States

Joan Deffeyes
Psychobiology
University of Nebraska at Omaha
316 North 48th Street
Omaha, Nebraska 68132
United States

Pedro Rodrigues
14 Granby Heights
Granby, 1033
United States

Megan Killian
215 South 5th
Bozeman, 59715
United States

Andre Morkel
23 Robinson St
Subiaco, WA 6008
Australia

Joshua Weinhandl
Biomechanics
Ball State University
2700 Silvertree Ln.
Muncie, IN 47304
United States

Chien-Ju Lin
412 West Redwood street
Baltimore, MD 21201
United States

Joseph Munaretto
Biomedical Engineering
University of Southern California
1317 Alvarado Terrace
Los Angeles, CA 90006
United States

Anirban Dutta
Biomedical Engineering
Case Western Reserve University
2235 Overlook Road
Cleveland Heights, OH 44106
United States

Florian Ullrich
Eulachstrasse 22
Winterthur, ZH 8408
Switzerland

Beth Moses
Accident Research & Biomechanics,
Inc
27811 Avenue Hopkins, Suite #1
Valencia, CA 91355
United States

Norman Reeves
Biomedical Engineering
Yale University
857 Orange St
New Haven, CT 6511
United States

John McCamley
SHRI-CORE Orthopedic Labs
1735 E Gaylon Dr
Tempe, Arizona 85282
United States

Karl Zabjek
Department of Physical Therapy
University of Toronto
160-500
Toronto, Ontario M5G 1V7
Canada

Anargyros Politis
Chemical Engineering
National Technical University of
Athens
5 Nektariou Str., Kipseli
Athens, Attiki 11251
Greece

Jayma Lallathin
Biomechanics
Ball State University
1016 W. Bethel Ave
Muncie, IN 47303
United States

Olumide Sofuwa
Rehabilitation Research
School of Health Professions and
Rehabilitation Sciences, University
of Southampton
Mailpoint 886, Level E,
Southampton General Hospital
Southampton, England SO16 6YD
United Kingdom

Tomoyuki Yamamoto
1-1 Asahidai
Nomi, Ishikawa 923-1292
Japan

John Fisher
School of Mechanical Engineering
University of Leeds
Woodhouse Lane
Leeds, West Yorkshire LS2 9JT
United Kingdom

Bart Koopman
P.O. Box 217
Enschede, ov 7500 AE
Netherlands

Jerry Clark II
Athletic Department
Eastern Michigan University
225 Victorian Lane
Belleville, MI 48111
United States

Onisoru Justin
Continuum Mechanics
Institute of Solid Mechanics of
Romanian Academy
Constantin Mille 15
Bucharest, 10141
Romania

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



KISTLER
measure. analyze. innovate.

VICON

 **Motion Analysis**

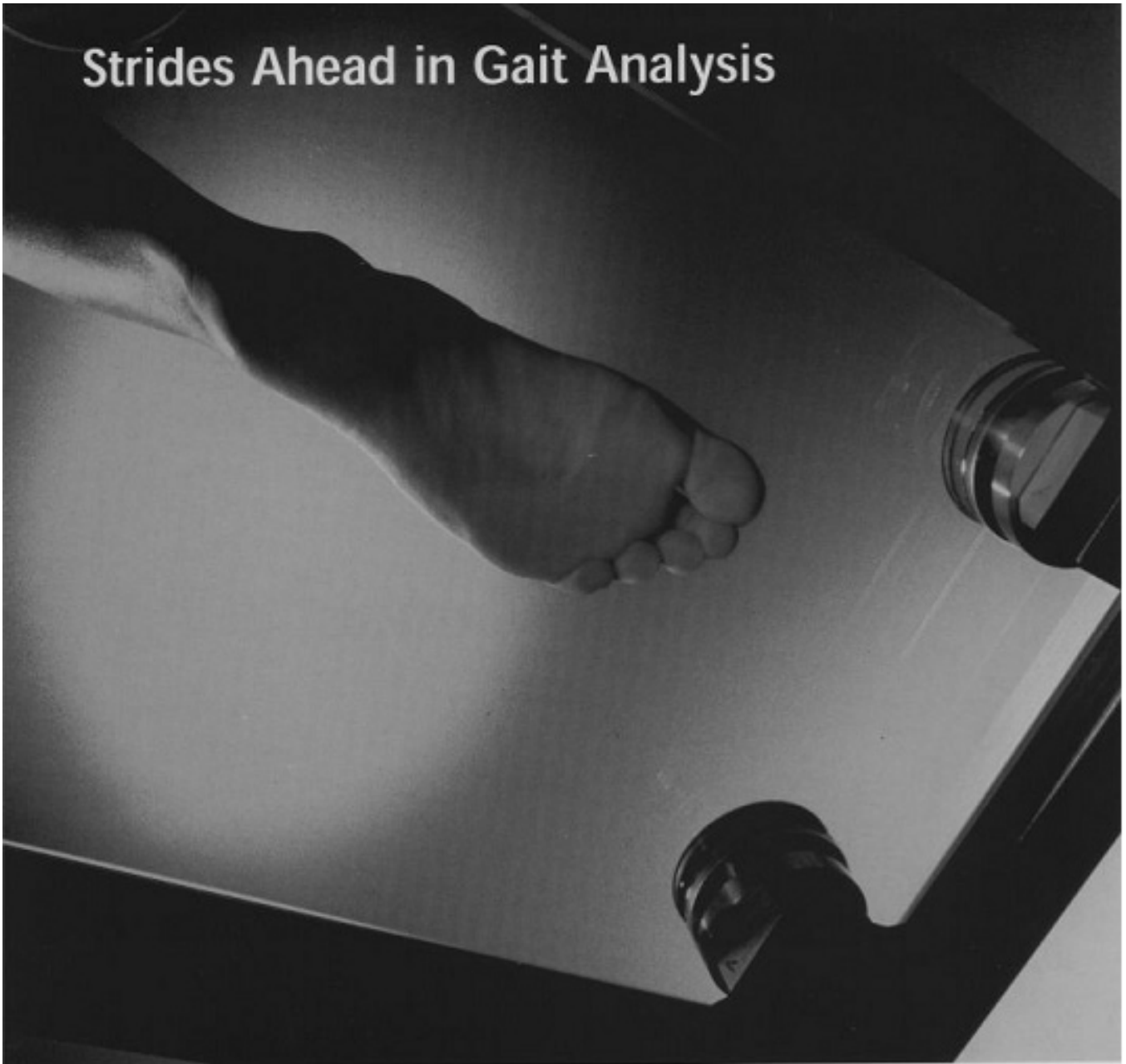
ANYBODY
TECHNOLOGY

Innovision Systems
INCORPORATED



ELSEVIER

Strides Ahead in Gait Analysis



Innovative design together with the highest quality of manufacturing results in the outstanding performance of Kistler Force Platforms.

Kistler Force Platforms meet the needs of virtually any application from dynamic sporting activity through to the quiet-rhythm of standing balance.

Contact us for more information.

Kistler Instruments Ltd., Alford House, Mill Lane, Alton, Hampshire GU34 2QJ, UK
Tel. +44 1420 54 44 77, Fax +44 1420 54 44 74, sales.uk@kistler.com

Kistler Instrumente AG, PO Box, CH-8408 Winterthur
Tel. +41 52-224 11 11, Fax +41 52-224 14 14, info@kistler.com

KISTLER
measure. analyze. innovate.