

# September 2016



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# List of new members, September 2016

By Ed Chadwick | September 2016

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## Fellows update: Brian Davis

By Ed Chadwick | September 2016



Brian Davis was one of the inaugural fellows of the ISB. Brian is Professor and Chair of the Department of Biomedical Engineering the University of Akron.

Brian is a native of South Africa, and received his bachelor's degree in Mechanical Engineering, and a master's degree in Medicine (Biomedical Engineering) from the University of Cape Town. He received his Ph.D. from Penn State University in 1991. Brian was a lecturer at the University of Cape Town Medical School from 1986 to 1988, and a Research Assistant at Penn State from 1988 to 1991, then was appointed an Assistant Professor, before moving to the Cleveland Clinic where he stayed until 2010, where he was an Associate Professor, Vice Chairman of the Biomedical Engineering Department, and Director of Medical Device Solutions.

His research focuses on: (1) Diabetic Foot Ulceration: The importance of mechanical factors such as pressure and frictional forces has been established as key in the etiology of diabetic foot ulcers. The rationale behind his research is that by quantifying localized skin loads and obtaining noninvasive measurements of tissue properties, factors leading to diabetic skin ulceration will be more fully understood. (2) Prosthetic sockets and liners: The target is to improve transfemoral prosthetic comfort by optimizing the thermal properties of the liner and socket polymer components. (3) Biomedical sensors: Development of sensors to assess connective tissue disorders. He has received research grants from agencies such as the National Institutes of Health, Cleveland Clinic Foundation, Whitaker Foundation, American Diabetes Association, The Howard Hughes Medical Institute, US Department of Defense, Aircast Foundation, and the *National Aeronautics and Space Administration*. In addition he has received funds from many industry sponsors.

Brian is currently the Principal Investigator on a project funded by the state of Ohio aimed at commercializing sensors for diagnosing connective tissue disorders. He is also leading an educational program named "BEST Medicine" that encourages middle and high school students to develop interests in engineering, science and technology, particularly as these relate to designing novel medical devices.

From 1995 to 2009 Brian was a member of the ISB Executive Council, was the Newsletter Editor 2001-2003, and from 2005 to 2007 served as the President. He was also a co-organizer of the 2005 ISB Congress in Cleveland, Ohio.

# Obituary: Professor Carlo De Luca

By Ed Chadwick | September 2016



Carlo De Luca (1944-2016)

Carlo De Luca, a long-time member of the ISB, passed away Wednesday, July 20<sup>th</sup> 2016 at the age of 72. Carlo contributed to biomechanics in many ways, in particular in the area of electromyography. His original research and reviews on EMG are seminal.

Carlo was born in Bagnoli del Trigno, Italy. He obtained an undergraduate degree from the University of British Columbia, and MS. and PhD from Queen's University. It was at Queen's that he met that other great expert in electromyography John Basmajian; their collaboration resulted in the 1985 edition of *Muscles Alive: Their Functions Revealed by Electromyography*. After completing his PhD he worked at the Liberty Mutual Research Center, serving as Project Director for over 20 years. While with Liberty Mutual he held academic appointments at MIT, and Harvard Medical School. In 1984 he joined Boston University, where he held the titles of Professor of Biomedical Engineering, Director of the NeuroMuscular Research Center, Research Professor of Neurology, Professor of Electrical and Computer Engineering, and Professor of Physical Therapy. At Boston University he trained more than forty graduate students, and even more research associates.

In 1993 Carlo founded a company, Delsys, which sells hardware and software for EMG. The separate wing of Delsys, Altec, was formed in 1997; it performs original research on new EMG methodologies. Carlo was both founder and CEO of these companies.

Carlo in recognition of his research has received many awards and honours including,

- Fellow of the International Society of Electrophysiology and Kinesiology, 2016
- Borelli Award from the American Society of Biomechanics, 2012
- Tibbetts Award (Small Business Technology Council of the USA), 2006
- Isabelle and Leonard H. Goldenson Technology Award (United Cerebral Palsy Foundation), 1999
- International Volvo Award on Low Back Pain Research (International Society for the Study of the Lumbar Spine), 1989

Professor De Luca was the Founder and President of the Neuromuscular Research Foundation. This foundation supports research in the fields of electromyography, motor control, and biomechanics across the globe. Indeed many ISB students in recent years have been the recipients of the largesse of the foundation (and Carlo). For the International Society of Biomechanics Carlo has been the personal sponsor of the Emerging Scientist Award. He has also been a major instigator of the ISB Working Group on Biomechanics, a group which has organized four symposia to date.

Biomechanics has lost one of its leading contributors, but whose work will continue to have impact.

# Motor Control Working Group

By Ed Chadwick | September 2016

## Professor Carlo John De Luca: in Memoriam



The [Working Group in Motor Control](#) is saddened by the death of its distinguished founder, Professor Carlo John De Luca, who passed away on July 20, 2016. A pioneer in the use of muscle recordings (Electromyography) for the study of human movement, he is recognized for introducing engineering principles to the field of Neurophysiology and for combining principles of Motor Control with the fundamentals of Biomechanics. His research has made breakthroughs on the frontiers of neuromuscular control, signal processing, and electromyographic sensor technology. Like Galileo Galilei, Professor De Luca challenged the status quo, with the understanding that empirical methods prevail over ideology to withstand the test of time. His

accomplishments are well recognized: he was recently appointed a Fellow of the International Society of Electrophysiology and Kinesiology (ISEK 2016), he received the 2012 Borelli Award (American Society of Biomechanics), and was invited to give the 1993 Wartenweiler Memorial Lecture (International Society of Biomechanics).

Professor De Luca believed strongly in the need to bridge Motor Control and Biomechanics to advance research in these fields. Thanks to his efforts, the [Working Group in Motor Control](#) was established as a Seed Group affiliated with the International Society of Biomechanics (ISB) at the XXIV Congress of ISB in Natal (Brazil), in 2013. It was later recognized as a Working Group of ISB at the XXV Congress of ISB in Glasgow in 2015.

Although saddened by the passing of Professor De Luca, we remain committed to the goal of fostering the interest in scientific work that bridges the fields of Motor Control and Biomechanics. The Working Group in Motor Control will continue to honor Professor De Luca's legacy, provide a forum to highlight research at the intersection of Motor Control and Biomechanics, and offer opportunities for both young and established investigators to interact and advance research in these fields.

## 5<sup>th</sup> Symposium on Motor Control in Biomechanics at ISB 2017, Brisbane (Australia)

The [ISB Working Group in Motor Control](#) is pleased to announce that the 5<sup>th</sup> Symposium on Motor Control in Biomechanics will be held in Brisbane (Australia) during the [XXVI Congress of the International Society of Biomechanics \(ISB\)](#) on July 23<sup>rd</sup>-27<sup>th</sup> 2017.

**Who Should Attend:** Researchers and students with an interest in Biomechanics and Motor Control should attend. Participants will have the opportunity to discover the latest developments in these fields and discuss with experienced investigators.

Check our [website](#) for updates in the coming months. We look forward to seeing you in Brisbane!

## Thank you for participating in the 4<sup>th</sup> Symposium on Motor Control in Biomechanics at ISEK 2016, Chicago (USA)

We would like to thank the attendees of the 4<sup>th</sup> Symposium on Motor Control in Biomechanics for a great event. The Symposium was held on Tuesday July 5<sup>th</sup> 2016 on the preconference day of the XXI Congress

of the International Society of Electrophysiology and Kinesiology (ISEK).



The symposium featured the following internationally distinguished researchers (see the event [flyer](#) for details):

**Opening: Paola Contessa** (Delsys Inc., USA)

**Invited Speakers:**

- **Joshua C. Kline** (Delsys Inc., USA) *“The empirically unsupported practice of estimating common synaptic inputs”*
- **Andrea D’Avella** (Universita' di Messina and Santa Lucia Foundation, Italy) *“Muscle synergies: biomechanical epiphenomenon or neural control strategy?”*
- **Paul Hodges** (University of Queensland, Australia) *“Probing muscle coordination with electromyography: Lessons from adaptation to pain”*
- **Patrick Crago** (Case Western Reserve University, USA) *“Augmenting voluntary reach and grasp in stroke survivors by functional electrical stimulation”*

Thank you all for participating and see you at our next event at ISB 2017!

ISB Working Group in Motor Control  
Paola Contessa, Delsys Inc. (USA)

## Report from International Shoulder Group and other upper limb news!

By Ed Chadwick | September 2016

The **International Shoulder Group** held its 11th conference in Winterthur, Switzerland, July 14-16 2016. We had a very successful meeting with participants from 13 countries, and more than 40 presentations on a range of shoulder topics. Our host Daniel Baumgartner put together a great meeting, including two interesting keynote speeches by PD Dr. Matthias Zumstein and Prof. Tobias Nef, an OpenSim workshop on shoulder modelling led by Dr. Dimitra Blana and Dr. Ricardo Matias, and an exciting social program.

Full papers based on conference presentations will be published as part of a Special Issue on the upper limb in International Biomechanics, thanks to the collaboration with Prof. Anthony Bull. All papers will be open-access, and the guest editors will be Daniel Baumgartner and Dimitra Blana.

We look forward to seeing all those interested in shoulder and upper-limb biomechanics at the sessions of the ISG during the next ISB Conference in Brisbane!

### **Ed's Note:**

In other upper limb news, the ISB has endorsed a meeting organised by the Institute of Mechanical Engineering entitled: **Engineering the Upper Limb**. This is to take place in London on 12-13 December and features keynote talks from ISB regulars Wendy Murray (Rehabilitation Institute of Chicago) and Dario Farina (University Medical Center Göttingen). There is still a few days left to submit an abstract! See the website for more details: <http://events.imeche.org/ViewEvent?code=con6414>.

## **Students' Corner**

By Ed Chadwick | September 2016

### **ISB2017 Update**

As I write, it's just over 300 days until the XXVI Congress of the ISB in Brisbane! I'm already looking forward to saying "G'day" to all those making the trip Down Under - as the [conference website](#) explains, you have to cut the "g" sound short and emphasise the "day". Our non-Aussie friends have plenty of time to perfect the national greeting, and I, for one, can't wait to hear your interpretations!

A few key dates for your diary:

- Call for abstracts: November 1, 2016
- Abstract deadline: January 13, 2016
- **ISB Congress Travel Grant deadline: December 15, 2016**

The Congress Travel Grant (CTG) program is designed to provide financial assistance to student members who will be joining us in Brisbane. The society will provide support of \$US600-1200, depending on the distance the successful applicant is required to travel. More information can be found [here](#), and please feel free get in touch ([isb.studentrepresentative@gmail.com](mailto:isb.studentrepresentative@gmail.com)) if you have any questions about the application process. The CTG is a great opportunity and I really encourage you all to submit an application.

### **Council Meetings and ASB2016**

As some of you will know, the ISB Exec. Council meets in the Congress off-year, typically just prior to a meeting hosted by one of our affiliated societies. This year, we descended on Raleigh for the 40<sup>th</sup> Annual Meeting of the American Society of Biomechanics. It was great to get the opportunity to meet some of you at our Aussie night, and at various other events throughout the week.

The council meetings are an exciting time to discuss the current student resources and to propose some new initiatives. Based on feedback from those who completed the Survey Monkey earlier this year (thanks again!) I was able to target some of the key issues that are important to our student body. There were some exciting conversations about an upcoming short video series trial being organized by our Education Officers - Glen Lichtwark and Taija Finni, so keep an eye out the first instalment!

Based on feedback regarding 'job alerts', our website management company recommended using the

Google Alerts service, available at:

<https://www.google.com/alerts>

You simply plug in a few details and some keywords (I'd specifically recommend using 'Biomch-L' as one), and you'll receive notifications about relevant postings. Best of all, it took me less than a minute to set up!

**Alerts**  
Monitor the web for interesting new content

Q Biomch-L Post Doc X

How often: At most once a day

Sources: Automatic

Language: English

Region: Any Region

How many: Only the best results

Deliver to: ISB.StudentRepresentative@gmail.c

**CREATE ALERT** Hide options ▲

**Alert preview**

There are no recent results for your search query. Below are existing results that match your search query.

**BLOGS**

**Postdoctoral** Position in Computational Modeling  
Biomch-L  
Applications are invited for an interdisciplinary **Post-Doctoral** Research Fellowship at the Institut de Biomécanique Humaine Georges Charpak at ...

**PostDoc** or Research Associate, University of Bern, Switzerland  
Biomch-L  
Statistical Modeling for Real Time Simulation of Refractive Surgery The Institute for Surgical Technology and Biomechanics University of Bern ...

**Postdoc** position in clinical biomechanics, human locomotion  
Biomch-L

At the council meetings we also discussed student events for ISB2017 including mentoring sessions, the potential for a cheaper student accommodation option, and the student excursion. Stay tuned for more information in upcoming editions of ISBNow.



## Advice to Students

We are up to our fifth video already! If you are new to the Society, our Advice to Students project involves eight short clips of ISB2015 delegates imparting some wisdom they've acquired during their time in the field of Biomechanics. The latest instalment comes from Prof. Taija Finni (our ISB Education Officer), and can be viewed [here](#). Dr. Finni adds a unique flavour to the series, raising the issue of work-life balance. Thank you very much again to all our presenters. Keep an eye out for our next video - Prof. Peter Milburn. Although he doesn't say "G'day" during the clip, Dr. Milburn is from Griffith University (an ISB2017 hosting institute), so he'll give you a taste of the Aussie accent (and some great advice of course!).

As always, stay in the loop by connecting with us via our social media channels ([Facebook page](#), [Student Members Facebook Group](#) and [Twitter feed](#)). If you have any feedback, questions or comments, I'd love to hear from you.

Kind regards,

Kirsty McDonald

isb.studentrepresentative@gmail.com

# ISB 2017 Tutorials: Imaging

By Ed Chadwick | September 2016

## What can modern imaging methods do?

We are pleased to announce that ISB tutorials in Brisbane 2017 will be given by Professor Peter Hunter, Professor Gregory Sawicki, Professor Lynne Bilston and by Professor François Hug, Dr. Dominic Farris and Dr. Bart Bolsterlee. Two of the tutorials focus on state-of-the-art imaging methods in biomechanics basic and applied research, and these are introduced in this issue.

## Ultrasound techniques for muscle-tendon imaging

*François Hug, Dominic Farris and Bart Bolsterlee*

Beyond the coordination between multiple effectors at different levels (e.g. between individual muscles, between joints), successful movements involve interactions between muscles and connective tissues (e.g. aponeurosis, tendons). In-vivo muscle biomechanical properties have been classically inferred from global methods (e.g. inverse dynamics, joint torque) that cannot isolate the behaviour of individual muscles or structures.

This tutorial will present an overview of the ultrasound methods that enable muscle and tendinous tissues to be imaged in real time. This tutorial will first introduce B-mode imaging and advanced methods to assess displacements within the muscle-tendon unit (semi-automated tracking, 3D freehand ultrasound). Second, the issue of probe positioning for 2-D measurements will be discussed through examples of the human medial gastrocnemius muscle. Future directions should combine displacements assessed using B-mode ultrasound with actual force applied on tissues. The third part of this tutorial will therefore present an ultrasound shear wave elastography technique that showed potential in estimation of both active and passive muscle force. Recent development of this elastography technique for tendon research will be presented. This tutorial will include both lectures and demonstrations.

## MR imaging in biomechanics

What existing and emerging MRI methods are useful for biomechanists, and how can you apply them to musculoskeletal, respiratory and neurological disorders?

*Lynne Bilston*

Magnetic resonance imaging (MRI) is commonly used to make structural and functional measurements in a wide variety of clinical and experimental contexts. However, it is also increasingly being used by biomechanists to make biomechanical measurements, including quantitative measurements of fluid flows, measurements of tissue mechanical properties, and joint and muscle kinematics. In this tutorial, you will learn about some of the current and emerging MRI techniques that can be used for biomechanics applications, their strengths and limitations, and examples of how they can be used for both research and clinical applications in a wide range of clinical disorders across the cardiovascular, neurological, musculoskeletal, and respiratory domains. We will also briefly discuss the use of MRI for building and validating computational models.

## Biomechanics in Chile and other updates from our EDC Officer

By Ed Chadwick | September 2016

In this issue of the ISB Now I would like to share two opportunities for the ISB members.

The first is the 1st Congress of the Chilean Society of Movement Science. The congress will happen next **November 16th to 18th in Santiago, Chile**. Please feel free to visit the congress website <http://www.accm.cl/>. It will be the first congress of the newborn Chilean Society of Movement Science!

The poster features a purple and blue background with a cityscape and mountains at the bottom. The text is white and yellow. It includes contact information, sponsors, and organizers.

**Congreso Asociación Chilena de Ciencias del Movimiento**

**V Jornada de Neurorehabilitación Clínica Los Coihues**

Santiago de Chile, 16 al 18 de Noviembre de 2016  
Expositores Nacionales e Internacionales.  
Recepción de Trabajos Libres hasta el 05 de Septiembre de 2016  
Becas a expositores de Trabajos Libres  
Workshops

Organiza:  
Clínica Los Coihues  
ACCM

Más Información:  
- congreso.accm@gmail.com  
- www.accm.cl

Patrocinan:

Auspician:

The second opportunity regards a series of lectures that professor Joseph Hamill delivered during his last stay in Brazil. He was taking part in the “Advance School of Physical Education, Physiotherapy, Phonoaudiology and Occupational Therapy”, which was organised by the Programas de Mestrado em

Ciências da Atividade Física da Escola de Artes, Ciências e Humanidades (EACH), Programa de Mestrado em Educação Física e Esporte da Escola de Educação Física e Esporte de Ribeirão Preto (EEFERP), Programa de Mestrado e Doutorado em Educação Física e Esporte da Escola de Educação Física e Esporte (EEFE), Programa de Mestrado e Doutorado em Ciências da Reabilitação da Faculdade de Medicina (FM), Programa de Mestrado e Doutorado em Fonoaudiologia da Faculdade de Odontologia de Bauru, and Programa de Mestrado e Doutorado em Reabilitação e Desempenho Funcional da Faculdade de Medicina de Ribeirão Preto (FMRP), with funding from Pró-Reitoria de Pesquisa of the University of São Paulo.

All lectures were live broadcasted and the records were kindly shared with the Brazilian Society of Biomechanics by professor Ulysses Ervilha, who is also a member of the executive board of the Brazilian Society of Biomechanics. We would like to thank Prof. Hamill for the brilliant talks and Prof. Ervilha and his team for making possible the recording of the lectures. Anyone can watch the lectures in this link: <https://www.youtube.com/playlist?list=PLFhTJTcYZ5efJSqvLOAYrKPLnvp37PXA>

## President's Blog, September 2016

By Ed Chadwick | September 2016

In August, the ISB council convened in Raleigh, North Carolina, for their annual meeting. The council meeting was held over two days, prior to the American Society of Biomechanics Conference in the same city. It was pleasing to see so many council members attend the meeting, as council members travel to all of our meetings at their own cost.



*ISB Executive Council in Raleigh*

A regular highlight of our off-year council meeting is listening to the presentations of those bidding for future ISB Congresses. This year we had three nominations submitted to the President Elect to host the XXVII Congress in 2019. From the three, two were chosen to present their bids to the council and I am pleased to announce that the team led by Professor Walter Herzog, a previous president of ISB, won the bid to host the 2019 meeting in Calgary, Canada. It was some years ago that the ISB Congress was held in Calgary, and I'm confident that the 2019 meeting will be just as successful as the last one they held in 1999. I would also like to thank the other bidding group that presented in Raleigh. Putting together a bid takes considerable effort, time and money and I would like to acknowledge and commend the group from Ottawa on an excellent bid. There was very little that separated the two bids, but of course, there can only be one winner, and we wish Calgary all the best with their preparations.

I would also like to thank the organisers of the American Society of Biomechanics Conference Dr's Greg Sawicki, Clare Milner and Katherine Saul for their hospitality in Raleigh. They held a very successful meeting with large delegate numbers showing the strength and breath of biomechanics in North America. It was also pleasing to see such a large audience attend the ISB sponsored keynote which was given by Dr Tibor Hortobagyi. Tibor regularly attends our own ISB Congresses and I've included a photo of Tibor being welcomed to the podium by Dr Paul deVita, President of ASB.



*Dr Tibor Hortobagyi being welcomed by Dr Paul deVita.*

I am also pleased to report that [ISB2017](#) preparations are progressing well. A program shell with conference themes and sub-themes has been published as well as key dates, such as the opening of Abstracts and Registration on 1 November 2016, the closing of abstracts on 13 January 2017 and the closing of Early-Bird Registration on 17 March 2017. ISB2017 promotional events have been well attended with ISEK, ASB, ISBS and ECSS delegates seen walking around photographing their koalas for the ISB2017 [Koala Challenge](#). The ISB2017 Down-Under event in Raleigh was also well attended with more than 200 delegates attending the function and getting a taste of the hospitality they will be receive in Brisbane next year.



*Rob Herbert and Suellen Holland promoting ISB 2017 in Brisbane!*

In closing, I'm delighted to be able to announce that Professor Jaap Van Dieen of VU University of Amsterdam has accepted the Congress Committee's invitation to give the Wartenweiler Memorial Lecture at the ISB2017 in Brisbane which honours Prof. Jürg Wartenweiler (1915-1976) the first President of the ISB. I know, like me, you are already looking forward to listening to Jaap's keynote. There will be more to come on keynotes and other congress events in my next report.

Until then...

Kind regards

Andrew