June 2014

ISB *Now*

June
2014

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President’s Blog

By Ed Chadwick | June 2014

As this issue of ISB Now was in preparation one of our long-time members, Arthur Chapman, passed away. Arthur was active at ISB Congresses through to the 1990’s, including presenting a keynote at one congress. My memories of Arthur go back to a visit he made to his alma mater, Loughborough University, when I was a student there. At the time he was very enthusiastic, and seemed equally keen to talk about his research or to find suitable opponents to challenge at squash. A fixture at ISB Congresses for many years, he will be missed. More details about Arthur can be found elsewhere in this issue of ISB Now.

As I write, the soccer World Cup has just started, and it is an interesting coincidence that this year the World Cup is in Brazil, and we held our 2013 Congress in Natal, Brazil, while in 2009 we held our Congress in Cape Town, South Africa and the 2010 World Cup was in South Africa. It makes me wonder if there is some covert connection between the ISB and the Fédération Internationale de Football Association (FIFA). At the moment FIFA are embroiled in discussions about their selection process for the 2022 World Cup venue. I thought I would use my space to explain the selection process that the ISB uses for our congresses.

The ISB holds its congresses every two years, with the invitation to submit bids circulated approximately four years in advance of a congress year. Bids are often voluminous and cover information on venue, congress format, hotels, projected registration fees, budget, and local attractions. Once the bids are received they are shortlisted after review by the ISB Council. The shortlisted bids are invited to make a presentation of their bid to the Council. These bid presentations occur approximately three years before the planned congress. This year we will be reviewing bids before the World Congress in Boston, in 2012 we reviewed bids after the ISEK Conference in Brisbane. The bid teams make presentations to the ISB Council providing details about their bid, and answer specific questions from Council members. The meeting concludes with a vote to select the future congress host.

What are the criteria used by the council for selecting a host? In any vote we all have certain biases, but there are many issues which are considered. For example, geographical spread of the congresses is an important issue. The ISB is an international society and we want to make sure the congress locations reflect our international mission. The last congress was held in Brazil, and this was our first congress in South America. While the congress was in Brazil various committees of the ISB used this opportunity to promote biomechanics throughout the continent. There has been a lot of recent activity from various countries in South America suggesting that this was successful. I like to pay attention to the cost of the congress, as this is an important issue for many delegates. Cost of course is not just the registration fees, as these are only a portion of the total expense for delegates; so the cost of hotel accommodation, food, and transportation are important considerations. There is a traditional format to an ISB Congress and the hope is that the bids will reflect this tradition while adding some local flavor. I am always impressed by the expertise around the table when the council reviews bids; many council members have organized a conference so understand the logistics of conference preparation. At the end of our meeting the winner is selected and feedback to all of the bidders provided.

The production of a bid is a lot of work, but for future hosts the hard work is only about to begin. It is also often the case that despite the best planning there is some unforeseen circumstance which during the congress has the organizers running around fixing problems. Remember that the hosts organize the conference, including the scientific program, all for the good of the society with little reward other than a pat on the back. It is often claimed that US presidents age more rapidly during their term in office (e.g., Olshansky, S.J. JAMA 306(21), 2328-9), and I suspect the same can be said of our congress organizers. Of course, at the end of the congress there is no lucrative book contract, or lecture tour, that accrue to retiring politicians, our congress organizers simply return to their regular duties (probably with a backlog to clear due to having to neglect their normal work in the run-up and during the conference). Our team for the ISB 2015 Congress in Glasgow has already been very busy working on exhibitors and inviting speakers. To the right is a picture of Phil Rowe who heads the Glasgow team. This is a before picture; hopefully the after picture will not reflect accelerated ageing!

To all who have bid on a congress and to those who have hosted an ISB Congress the ISB and its membership are in your debt, and we continue to offer you our thanks.

Regards,

John.

John Challis

Penn State University

(jhc10@psu.edu)

Students' Corner

By Ed Chadwick | June 2014

Hello ISB Trainees,

I am looking forward to seeing many of you at the World Congress of Biomechanics in July. The ISB is hosting a few events that you do not want to miss – so mark your calendars!

ISB Trainee Mixer: Tuesday July 8th from 7-10p at Champions Boston in the Boston Marriot. Some food and drinks will be provided. Current and prospective ISB Trainees are welcome! At 7:45PM, a panel discussion on networking will take place. The panel will include the following ISB members:

Allison Gruber, PhD: Post Doctoral Fellow, Faculty of Kinesiology, University of Massachusetts Amherst (will begin as Assistant Professor at University of Indiana – Bloomington in Fall), http://www.umass.edu/sphhs/person/postdoc/allison-gruber

Brent Edwards, PhD: Assistant Professor, Faculty of Kinesiology, University of Calgary
http://wcm16.ucalgary.ca/knes/profiles/brent-edwards

Ross Miller, PhD: Assistant Professor, Department of Kinesiology, University of Maryland
http://sph.umd.edu/KNES/faculty/rosshm/ross.html

Ron Zernicke, PhD: Professor and Dean, School of Kinesiology, University of Michigan
http://www.kines.umich.edu/profile/ron-zernicke-phd-dsc

Joe Hamill, PhD: Professor, Department of Kinesiology, University of Massachusetts Amherst
http://www.umass.edu/sphhs/person/faculty/joseph-hamill

ISB Symposium on Motor Control: Tuesday July 8 from 2:30-6pm

Other Affiliated Events:

Delsys workshop: Bridging Motor Control and Biomechanics: What can advances in Sensor Technology Offer? Sunday July 6th 12-2:15p – register at http://www.delsys.com/news/workshops/

American Society of Mechanical Engineers Student Programming (all are welcome):

Tuesday July 8 – Academic Careers Panel 1-2 PM

Tuesday July 8 – Industry Careers Panel 6:30-7:30 PM

Thursday July 10 – Grant Funding Panel 6:30-7:30 PM

Thursday July 10 – Graduate Student Social 8PM at LIR (903 Boylston Street)

For those of you who will not be at WCB 2014, I hope to see you in Glasgow next summer. In July, we will begin planning trainee programming for ISB 2015. I would love some ideas and feedback from the student members. Please email me any suggestions for programming or ISB Trainee Initiatives.

Don't forget to follow @ISBiomechanics (twitter), International Society of Biomechanics (Facebook), International Society of Biomechanics Student Group, and the International Society of Biomechanics members LinkedIn page.

All the best,

Kelsey Collins
isb.studentrepresentative@gmail.com

Technical Groups update

By Ed Chadwick | June 2014

New Seed Group on Motor Control

A new Motor Control Seed Group was accepted at the last ISB Congress in Brazil; details of the new

group and an upcoming symposium at the World Congress can be found here.

International Shoulder Group

The ISG Technical Group is looking forward to its 10th biennial meeting in Waterloo, Canada, immediately following the World Congress. The two day meeting, starting on the evening of the 9th of July, will feature keynote talks from Dr. James Johnson, University of Western Ontario, and Dr. John O'Neill, McMaster University, and is Chaired by Dr Clark Dickerson of the University of Waterloo. Further details can be found on the conference website.

3D Analysis of Human Movement

The 13th International Symposium on 3D Analysis of Human Movement will be held at the École Polytechnique Fédérale de Lausanne (EPFL), Switzerland, from **July 14 to July 17 2014.** Their meeting will feature no less than seven keynote speakers supporting the Sport and Rehabilitation theme of the Symposium. More information can be found on their conference website.

Biomechanics gaining momentum in India and Colombia

By Ed Chadwick | June 2014

Andrea Hemmerich, EDC Project Officer

It has been almost two years since I received an email from Prof. Rajani Mullerpatan who, with encouragement from former ISB President Julie Steele, sought ISB support to establish a biomechanics centre at her home university in India. Shortly thereafter, we "met" on Skype, the first of many conversations with each of us either up late or early to accommodate the 9 ½ hour time difference between Mumbai and Ottawa. It did not take me long to realize that Rajani had the passion and expertise to advance the biomechanics agenda in India and I feel fortunate to be working with her in support of this goal.

Rajani, like many EDC scholars, pursued graduate studies overseas as graduate-level biomechanics research opportunities in India are few and far between. Her PhD at Cardiff University in the UK led to an academic position in Nottingham; her experience and professional networks gained at that time have since helped her grow the field of biomechanics in India.

Rajani has partnered with Prof. Robert van Deursen (Cardiff) and professors at the Indian Institute of Technology, Mumbai, to support her new Biomechanics Centre. Their combined expertise and complementary academic backgrounds in physiotherapy, rehabilitation science, and engineering, allow them to support one another on research and teaching, as well as installation and future operation of equipment in the Clinical Biomechanics Lab that is currently under construction at the MGM Institute of Health Sciences (MGMIHS).

In addition to the existing Novel Emed pressure platform, Rajani would like to acquire a motion capture system and force platforms to create a state of the art research and clinical laboratory, unprecedented in the region of South Asia that is home to over one fifth of the world's population. An ISB-EDC grant supported Rajani's travel to the ISB2013 Congress in Brazil, where we not only (at last) had the pleasure of meeting in person, but also connected with an AMTI representative through introductions by then ISB President, Ton van den Bogert. Both AMTI and, more recently, Vicon have responded positively to discussions on equipment donations, and/or sponsored purchases depending on the outcome of a research grant for which Rajani has applied through the Government of India.

Figure 1 (a) Robert van Deursen (left) describing requirements for equipment installation to engineers in Mumbai with Rajani Mullerpatan, MGMIHS Biomechanics Centre Director (right). (b) The vast space – in high demand in the densely populated city of Mumbai - procured by Dr. Mullerpatan for the Clinical Biomechanics Lab at MGMIHS is shown (May 2014).

Most recently Robert van Deursen spent a week in Mumbai with the objectives of helping Rajani design the lab space together with local structural engineers. Robert's experience helped clarify misunderstandings around the physical lab set-up, undoubtedly averting major problems down the road. Further to planning the gait lab, Rajani and Robert had an opportunity to develop research and educational initiatives. In describing the outcomes from his "intense" trip, Robert wrote:

What cannot be easily explained in the report is that meetings were held in various parts of Mumbai and therefore a considerable amount of time was spend in vehicles travelling through heavy congestions. Some of our best meetings were held during these travels.

If all goes according to schedule, installation of the AMTI force platforms and Vicon motion capture system at the lab in Navi-Mumbai will take place later this year. To learn more about the MGMIHS project and to read Robert's trip report, please visit the MGMIHS webpage.

India is not the only developing country where biomechanics is growing in importance. Stemming from the EDC Workshop that I facilitated at the ISB2013 Congress, Prof. Felipe Carpes (Vice-President, Brazilian Society of Biomechanics) in his characteristic creative and resourceful style, initiated my involvement in the 2nd International Congress of Biomechanics (ICB) taking place in Medellín,

Colombia in November 2013.

Figure 2 Felipe Carpes (left) and Jose Acero speaking at ICB in Medellín, Colombia, November 2013.

Felipe and Jose Acero, Scientific Director of the Biomechanical Solutions and Research Institute in Colombia and ICB Organiser, had both participated in the ISB-EDC Workshop and recognized the opportunity to support one another in their ambitions to grow biomechanics in Latin America. Jose had also wanted to introduce his Colombian biomechanics colleagues to the opportunities available through the ISB and so we coordinated a webinar that would be translated from English to Spanish and would allow participants to ask questions about the EDC programme.

The response I received to my presentation was simultaneously favourable and inspiring. Audience members asked for details about the EDC proposal process and whether regional research collaborations would be encouraged. (Yes, of course!) In order to promote active cooperation amongst interdisciplinary teams of researchers to support sustainable biomechanics initiatives, I recommended reviewing the *Memorandum of Understanding* template that can be downloaded from the EDC webpage. Felipe also reported that he had received inquiries about exchange opportunities and foreign study at the Masters and PhD levels in Brazil and other Latin American countries.

Following the ISB-EDC presentation, Jose announced the inauguration of the Colombian Association of Biomechanics, with himself as the first elected President. Congratulations to Jose, his Executive Council, and all members who are paving the way for biomechanists in Colombia and Latin America.

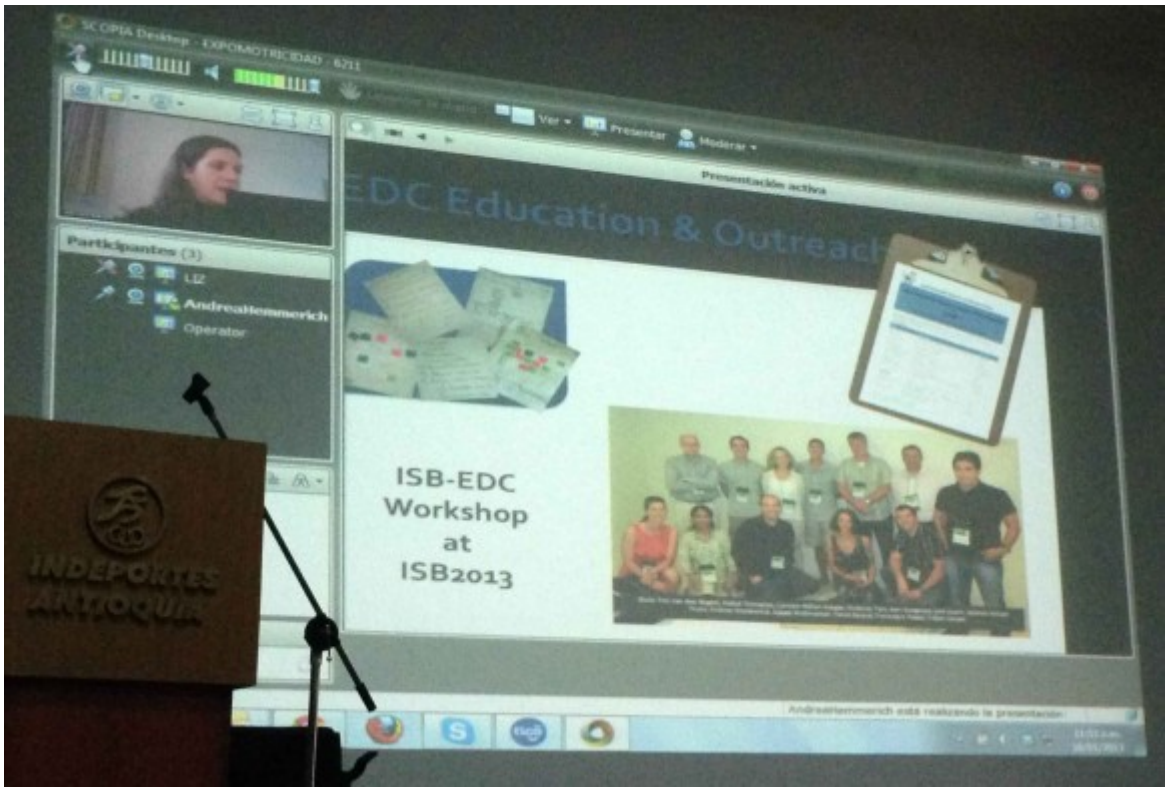

Figure 3 Andrea Hemmerich presenting via web link at ICB in Medellín, Colombia, November 2013.

The potential for biomechanics research, education, and clinical application in these parts of the world is

immense. Not only are EDC researchers and their collaborators worldwide making valuable contributions to our current body of knowledge, they are leading groundbreaking research in areas of biomechanics particular to their own regions. The international biomechanics community has much to gain from the growth of biomechanics in developing regions and I am thrilled to know that our ISB-EDC colleagues in Colombia and India are making it happen.

Professor Arthur Chapman (1941-2014)

By Ed Chadwick | June 2014

Professor Arthur Chapman, a long time ISB member, has recently passed away at the age of 73. Arthur was active in research on muscle coordination, particularly in sporting activities. He was a keynote speaker at the ISB Congress held in Amsterdam in 1987.

Professor Arthur Chapman (1941-2014)

Dr. Chapman received a DLC Diploma from Loughborough College in 1963, an MA from Ohio State, an M.Phil from London University in 1969, and a PhD from the same institution in 1975. In 1970 he was appointed as Visiting Assistant Professor at Simon Fraser University. In 1975 he was appointed as Assistant Professor in the Department of Kinesiology at Simon Fraser University, promoted to Associate Professor in 1978, and became a Full Professor in 1984. In 1965 he was a Fulbright scholar, and in 1992 the Rosenstadt Research Professor for the University of Toronto in 1992. He retired from SFU in 1999 and became Professor Emeritus. During his retirement he wrote a book entitled “Biomechanical Analysis of Fundamental Human Movements” published by Human Kinetics.

Some of his papers include:

- Chapman, A. E., Lonergan, R., & Caldwell, G. E. (1984). Kinetic sources of lower-limb angular displacement in the recovery phase of sprinting. Medicine and Science in Sports and Exercise, 16(4), 382-388.
- Chapman, A. E., & Caldwell, G. E. (1983). Factors determining changes in lower limb energy during swing in treadmill running. Journal of Biomechanics, 16(1), 69-77.
- Chapman, A. E., & Caldwell, G. E. (1983). Kinetic limitations of maximal sprinting speed. Journal of Biomechanics, 16(1), 79-83.
- Chapman, A. E. (1985). The mechanical properties of human muscle. Exercise and Sport Sciences Reviews, 13(1), 443-501.
- Chapman, A. E. (1988). How muscular mechanical properties govern technique in sports. In

G. de Groot, A. P. Hollander, P. A. Huijing & G. J. Van Ingen Schenau (Eds.), Biomechanics XI-A (pp. 545-554). Amsterdam: Free University Press.
- Caldwell, G. E., & Chapman, A. E. (1991). The general distribution problem: A physiological solution which includes antagonism. Human Movement Science, 10(4), 355-392.
- Chapman, A. E., & Sanderson, D. J. (1990). Muscular coordination in sporting skills. In J. M. Winters & S. L. Y. Woo (Eds.), Multiple Muscle Systems: Biomechanics and Movement Organisation (pp. 608-620). New York: Springer-Verlag.
- Herring, R. M., & Chapman, A. E. (1992). Effects of changes in segmental values and timing of both torque and torque reversal in simulated throws. Journal of Biomechanics, 25(10), 1173-1184.

Dr. Chapman was an outstanding athlete, playing rugby for Rosslyn Park. Once at Simon Fraser University he became keen and successful squash player. Some of his biomechanical research looked at frictional properties of different squash court flooring and the mechanical properties of squash racquets and strokes. In retirement his focus became golf.

We extend our sincere condolences to wife Stella Chapman, children Sam and Pia, and four grandchildren.

ISB at the World Congress

By Ed Chadwick | June 2014

At the upcoming World Congress of Biomechanics, to be held in Boston, there will be a number of ISB coordinated events. These include the following podium sessions,

Monday, July 7th

ISB - Footwear Biomechanics I: Force

Session Chairs: Benno Nigg and Toni Arndt

Tuesday, July 8th

ISB - Footwear Biomechanics II: Muscle

Session Chairs: Irene Davis, Karen Mickle, and Toni Arndt

ISB - Footwear Biomechanics III: Movement

Session Chairs: Toni Arndt and Benno Nigg

ISB Footwear Biomechanics IV: Foot and Ankle

Session Chairs: Sicco Bus, Alison Gruber, and Toni Arndt

ISB Motor Control

Session Chair: Carlo De Luca

ISB Student Event

Trainee Mixer from 7 to 10 PM at Champions Boston (see ISB Facebook page for more details).

Wednesday, July 9th

ISB Presidential Symposium I

Session Chairs: Ton van den Bogert and John Challis

ISB Presidential Symposium II

Session Chairs: John Challis and Ton van den Bogert

New Motor Control Seed Group

By Ed Chadwick | June 2014

We are very pleased to announce the creation of a **Motor Control Seed Group** affiliated with the International Society of Biomechanics (ISB). The Motor Control Seed Group will provide a forum to highlight and foster the increased interest in scientific work that bridges the fields of Motor Control and Biomechanics.

We are also pleased to announce that, within this group, a new **Motor Control in Biomechanics Symposium** is being planned for the upcoming 7th World Congress of Biomechanics (WCB) from July 6-11, 2014 in Boston, Massachusetts, USA.

The goal of this Initiative, sponsored by the International Society of Biomechanics (ISB), is to offer a structure through WCB and ISB leadership for bringing together ISB members and biomechanists around the world to display their work on the understanding and application of motor control.

The ISB Symposiumwill open with a Keynote Lecture by Prof. Zev Rymer from the Rehabilitation Institute of Chicago and will feature internationally renowned speakers in Motor Control and Biomechanics. (click here for details or visit the event page).

When: July 8th 2014, 2:30 – 6:00 PM

Keynote Speaker

Prof. Zev Rymer (Rehabilitation Institute of Chicago, USA)

Invited Speakers

- *Prof. Neville Hogan* (Massachusetts Institute of Technology, USA)
- *Prof. Walter Herzog* (University of Calgary, Canada)
- *Prof. David Lloyd* (Griffith Health Institute, Australia)
- *Prof. Steven Robinovitch* (Simon Fraser University, Canada)
- *Prof. Thomas Buchanan* (University of Delaware, USA)
- *Prof. Marco Santello* (Arizona State University, USA)
- *Prof. Paola Contessa* (Boston University, USA)
- *Prof. Evangelos Christou* (University of Florida, USA)

We look forward to seeing you at the next WCB conference in Boston!

Sincerely,

Prof. Carlo J. De Luca, PhD

Prof. Philip Rowe, PhD

Update from the Polish Society of Biomechanics

By Ed Chadwick | June 2014

Fast progress in the development of biomechanics generates the need of periodic meetings of specialists in different fields, so the newest results can be shared and problems discussed. That is why The Polish Society of Biomechanics (PSB) decided to make an opportunity for the biomechanics community to exchange new ideas and experiences. Every two years, in a different city of Poland, an international conference is organised under the patronage of the PSB and named “BIOMECHANICS”.

The upcoming edition will take place on September 1-3, 2014 in Lodz, and the task of its organization have been entrusted to two units of Lodz University of Technology: Department of Automation, Biomechanics and Mechatronics and Faculty of Organization and Management.

As in the past, this year we expect to host many excellent specialists from widely defined areas in biomechanics, who are regular participants in our conference as well as many new guests. This year, there are registered already 120 abstracts prepared by nearly 300 authors from 17 countries. They belong to very widely understood disciplines of biomechanics and cover such themes as: clinical biomechanics, engineering biomechanics, sport biomechanics, biomaterials and implants, computational methods in biomechanics, cellular and molecular mechanics, and many others.

As in previous editions, also this year, during conference will take place the Young Investigators Competition for the Morecki & Fidelus Award, named after two precursors of the biomechanics in Poland. It is an excellent opportunity for young and/or unknown authors to present their research and

open doors to further scientific career in field of the biomechanics.

More information about BIOMECHANICS 2014 can be found at our website http://biomechanics2014.pl/.

ISB Travel Grant Report

By Ed Chadwick | June 2014

Aaron Fox, *PhD Student*

School of Exercise and Nutrition Sciences, Deakin University
Melbourne, VIC, Australia

The International Society of Biomechanics International Travel Grant Program gave me the opportunity to visit the Human Performance Innovation Laboratory (HPIL) at the University of Michigan. I am currently completing my PhD under the supervision of Dr. Natalie Saunders and Dr. Jason Bonacci at Deakin University in Melbourne, Australia. The travel grant I received allowed me to work with my external supervisor, Dr. Scott McLean, for four months between December, 2013 – March, 2014.

The first thing anyone needs to know about Ann Arbor, Michigan is it's cold. With temperatures regularly reaching -20°C, there was often a 40-50°C difference in the temperature compared to what I would be experiencing back home in Melbourne. This type of weather, including snow on most days, was great to experience and something you can't get anywhere in Australia.

The HPIL is currently undertaking a multi-year project examining the use of wireless inertial measurement units (IMUs) in analysing warfighter performance and performance degradation. In addition to this work, I was also able to collect some data using wireless IMUs to analyse side-step cutting performance. Due to their non-invasive and highly portable nature, wireless IMUs provide an excellent option for the biomechanical analysis of field-based human performance, not only for physically demanding occupations, but also in sporting and clinical settings. Therefore, it was a great opportunity to gain experience in the collection and analysis of data using these devices.

Being in the United States during March also allowed me to attend the American Society of Biomechanics Midwest Regional Meeting at the University of Akron. I was lucky enough to be able to present at the meeting on the ability of wireless IMUs to detect fatigue during a step-up/step-down exercise. The meeting had a student focus, therefore this was a great opportunity to present in front of my peers and see the research being undertaken within other biomechanics labs from around the United States. Some highlights from the conference included Prof. Ton van den Bogert's keynote on the applications of human musculoskeletal modelling, and Dr. Carin Helfer's workshop on the use of polymers in improving safety in sports.

Along with the academic side of things, I was also able to take part in other aspects of the American collegiate experience. In particular, taking in the University sporting events on offer was a definite highlight, as this is completely different than anything on offer in Australia. The 'Big House' at the University of Michigan where football matches are held is something unlike anything I've experienced, and is a must see spot if ever in Ann Arbor.

I would like to thank a number of people for making this trip possible and a wonderful experience. First and foremost, to Dr. Scott McLean, for bringing the International Travel Grant to my attention and allowing me to visit and work in your lab I will always be grateful. To those I met at the University of Michigan – Noel Perkins, Grant Goulet, Steven Davidson, Ryan McGinnis, Stephen Cain, Lyndsey Lepley, Shannon Pomeroy, Jessica Deneweth and David Whiteside – thank you for all your help and making the

experience a great one. Finally, thanks must go to the International Society of Biomechanics for providing the opportunity to partake in the International Travel Grant Program.