The President’s Corner

I am quite sure that all of you expect that the role of the ISEA Executive Committee, and by extension, that of the ISEA president, is all about glamour and excitement. Well, our ability to recruit future members of the EC may be damaged by what I am about to say. But in fact a lot of what we do is just plain getting the business of the ISEA done. To that end, when this EC took office, I charged the team with really focusing on some of the more mundane issues at hand to keep the ISEA on a solid foundation as we look to the future. I want to share some of our efforts in this area. Not with the goal of boring you to tears, but rather to share with you some of the on-going initiatives of the EC, and by doing so, acknowledge the work and efforts of this great team of volunteers. Also, I do hope that each of you will feel a bit more connected to the ISEA by knowing about what goes on behind the scenes.

Last fall, after several years of excellent service, our administrative officer, Pam Wheen announced that she was ready to step down from her post and requested that we begin to search for a successor. I am pleased to announce that the search process was quite short, resulting in returning a familiar face to the role, Amanda Brothwell. Along with Amanda’s acceptance of the role, the administrative functions will be transferred across the town of Sheffield to Sheffield Hallam University. From an administration perspective, this is a win-win for the ISEA. The close proximity of Pam and Amanda, coupled with both of their having experience in the administrative officer role will mean that a minimal amount of effort will be required in the transition allowing Amanda to quickly turn her focus to future initiatives. Pam, on behalf of all the ISEA, thanks for your help. Amanda, welcome back. Heather Driscoll, the ISEA Secretary has facilitated this quick transition. Thanks Heather.

Another transition underway is the change in leadership at Sports Engineering, with ISEA Past-President Alan Bramley managing the transition. The ISEA policy is to name an Editor in Chief for the journal for a three-year term, allowing for a re-appointment for a second three-year term. As of this summer, Martin Strangwood will have served out his second term as editor. Martin will be passing along the journal that is vibrant and healthy with a number of high quality submissions in the review process for 2013. With the addition of Tom Allen and Simon Chopin as associate editors, and a newly re-vamped editorial board, the new Editor in Chief will be starting his/her term of service on a solid footing.

Since I first joined the executive committee in 2008, one task I have really enjoyed is being part of the ISEA conference selection process. I always find it interesting to get to know more about the groups that submit proposals and discuss with my family the vacation options we might consider based on the conference location. (Right now, my daughter, a Harry Potter fan, is absolutely ecstatic that Kings Cross is on our list of places to visit en-route to Sheffield Hallam in 2014.) The time to begin considering the location of the 2016 conference is upon us. Very soon, an official call for proposals will be released, with proposals due toward the end of this year. I can’t wait to start thinking about the possibilities! The real work in managing this process is led by the conferences subcommittee, chaired by Nicola Petrone. (As I write this, I believe Nicola is spending the week skiing. Rather I mean teaching at the ISEA Winter-school. How do I get his job?)

I want to thank Lloyd Smith, chair of the publications committee for pulling together the ISEA newsletter and giving me a column to share my thoughts. I expect that the hardest part of Lloyd’s job is getting timely submissions (including mine), so if you have something that you would like to share in the next issue, let him know.

The above is only a subset of the initiatives currently underway, and I do plan to share more in future newsletters. You have a great team working very hard to make the ISEA the best that it can be for you.

And that my friends and colleagues, is glamorous and exciting for this sports engineer.
ISEA Winterschool 2013:
Research Methods in Wintersports
Nicola Petrone

On March 8th 2013 the 3rd ISEA Winterschool in Sports Engineering ended. The school was held in San Vito di Cadore- Cortina, Italy over 5 days with 28 students and 8 teachers from Italy, Germany, Sweden Japan, Luxembourg & USA. It was an exciting experience for all the participants. The days were busy for all with lecturers on:

- Research Methods (N. Petrone, Italy)
- Instrumentation (A. Koptyug, Sweden)
- Snow Friction (S. Odenwald, Germany)
- Safe Jump design (McNeal & M. Hubbard, USA)
- Luge accident analysis (M. Hubbard, USA)
- Biomechanics and Protective Equipment (V. Senner, Germany)
- Environmental effects (A. Pezzoli, Italy)

The students were grouped into six teams that conducted research on skis, boots, vibration, turning, jumping, and snowboards. After two days of field tests and data collection, the teams reduced their data and presented the results to the group and industry representatives. Prof. James McNeal (Colorado School of Mines, USA) summarized the experience well with “I never worked so hard while having so much fun”.

The success of the experience was due also to support from the industry sponsors (Nordica, Instrumentation Devices, IMC), the ISEA association, the Department of Industrial Engineering of Padova University and the local administration and slope management.

A synergy of collaboration and resources allowed the group to spend 5 full days in the unique environment of Dolomites, speaking and practicing Wintersports engineering, building friendship and esteem. We are sure that the fruits of such a strong experience will soon appear in our community.
Sports Technology Podcast

The Sports Technology Podcast is a collaboration between Henry Hanson and Mike Vasquez at Loughborough University’s Sports Technology Institute. Over forty guests have come on the podcast to discuss the latest news in the world of sports, engineering, design, and business. Guests have included engineers at Burton Snowboards, adidas, and Speedo as well as researchers from institutions such as the University of Michigan, MIT, Loughborough University, and the University of Southern Mississippi. Each episode lasts about 20 minutes with the aim of providing a platform for industry professionals, entrepreneurs, and researchers to discuss their work and share their thoughts on the evolving role of technology in sports.

Both Henry and Mike presented at last year’s ISEA conference in Lowell, MA. Henry is in the final year of his PhD at Loughborough, researching soccer ball impact dynamics in collaboration with adidas. Mike finished his PhD last year and is now living back in the US working to start his own company to track performance and safety through wireless sensors. You can check out the podcast on iTunes or at www.sportstechnologypodcast.com. If you’d like to be a guest or have ideas for future shows please email info@sportstechnologypodcast.com or Tweet to @sportstechpod.

Sports Engineering Journal

Best paper award

The editors have initiated an annual “Best Paper Award”. Congratulations to Andrew. D. Swedberg, James. A. McNeil and Mont Hubbard for their paper “Designing tomorrow’s snow park jump”. Each author received a plaque and two year’s membership, the paper will be available as open access for six months.

Invited papers and special issues

The journal intends to include one special issue a year. The first special issue (16.4) is themed around winter sports with Peter Federolf as the guest editor. The second special issue will be on helmet design and impact performance and will consist of selected papers from the recent “Helmet Performance and Design Conference”. Anthony Bull, Peter Childs, Sean Maw and Mazdak Gahkari are guest editors.

We are also introducing invited review papers to the journal. These papers will serve as a ‘go-to’ resource for researchers interested in a particular area. Current review paper topics include aerodynamics of projectiles and impact mechanics.

Paper turnaround

After an ‘Editorial Summit’ at Birmingham University’s leafy campus the team now have a streamlined submission process. We are confident that this will cut down on delays in the reviewing process, decreasing time to turnaround. We continue to encourage authors to submit their articles to the journal.

We welcome comments and suggestions to any member of the editorial team.

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Associate Editors: Tom Allen
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Simon Choppin
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Sports Engineering in the Land of the Rising Sun
by Motomu Nakashima

The Sports Engineering community in Japan was formed in the early 1990’s. The annual symposiums have been held actively and successively since 1990. In 2011, the Professional Committee of Sports and Human Dynamics (SHD) was established in the Japan Society of Mechanical Engineers, as the new framework for the Sports Engineering community in Japan (see the new logo below). The chair of the Committee is Professor Sadayuki Ujihashi, who is the former President of the ISEA. The annual symposium last year was held in Aichi University and was very successful. The number of papers and participants were over 100 and 200, respectively (photo of the symposium is on the upper right). The Committee is providing the activities not only for the academics and industries, but also for the general public and children to promote the sports engineering. The photograph (lower right) shows the Scientific Swimming Class for Kids, which was held in the summer of 2011. In this class, the recording of the swimming motion by a specially developed camera system was provided to coach the participants effectively. A computer simulation technique for swimming was also introduced to stimulate the scientific curiosity of the children. We hope they will take part in the sports engineering in future!

Darts….. Just What Goes On in the Air?
David Culliford

The flight of a dart is affected by aerodynamic forces. Throughout the history of the sport the dart has been modified and redesigned to be as slim and streamlined as is realistically possible. Modern players often change flight and shaft configurations to alter the aerodynamic properties of a dart.

A recent example of the effect of aerodynamics in the sport could be seen at the 2012 World Championship Final. James Wade and Adrian Lewis refused to complete the game until a reported draft was eliminated which they claimed was affecting the flight of their darts.

I decided to investigate the aerodynamics of darts for my final year dissertation, as part of my undergraduate degree in Sport Technology at Sheffield Hallam University. Following an initial search I was surprised by the lack of published literature on dart aerodynamics. I resolved to try and identify and quantify the aerodynamic effects on a dart (whilst hopefully replicating gameplay conditions).

Fig1: Scaled Up Dart Design
Darts (continued)

Preliminary wind tunnel testing

Testing was undertaken in the University wind tunnel (TQ AF100 Subsonic Wind Tunnel). The dart was attached to a sting protruding from the rear of the dart to minimise interference with the air flow around the dart. It soon became apparent however during pilot testing that the wind tunnel was not sensitive enough to pick up such small output values for drag and lift.

To gain reliable data from a dart tested in the wind tunnel the dart was scaled up to twice full size, see Fig. 1. To attach it to the sting four individual flight sides were welded to the shaft of the dart as shown in Fig 2.

It is planned to measure the values of both drag and lift forces for the dart at different speeds (from 5 to 30 ms$^{-1}$ at 5ms$^{-1}$ intervals) and at different inclined angles (between 0-20$^\circ$ with respect to the horizontal). As for collecting the data the software package linked into the wind tunnel allows all data to be automatically input into a table once the recording parameters are set (10 data points recorded at 2 second intervals for each test).

The expected outcome of the completed study is a scientific analysis of a dart which could lead to better understanding of the dart in flight. Further down the line is the possibility of developing 'technique analysis' for professional players; which result in an improved throwing action and the testing different dart configurations for the best results for the individual.

Sports Engineering: A Student’s Perspective

Nadine Lippa

Last July, my University of Southern Mississippi colleagues and I attended our inaugural ISEA biannual meeting in Lowell, Massachusetts. We were excited to enter an entire community of problem-solvers striving to mimic on-field conditions in order to understand and quantify human performance. My group was fortunate to meet and network with people, as well as set up academic and technical collaborations with other ISEA 2012 attendees.

However, I observed three under-represented groups: students, USA programs, and materials-focused sport engineers. The lack of students was somewhat anticipated, as my university’s attendance was limited by conference attendance costs. As for USA programs, it’s an unfortunate reality that multidisciplinary programs are not nurtured in times of financial recession, and sports engineering may not have the same notoriety or support as traditional science programs. Finally, at the ISEA open forum session, a sport industry representative illustrated a problem: she desired someone with the ability to simultaneously communicate with the R&D chemist, biomechanist, sporting goods manufacturer, and end user. Sitting rows away, the solution was realized in collaboration with our Southern Miss sports materials research group. Sports engineering requires us to be multidisciplinary, but representing all skill levels, geographic locations, and disciplines is challenging.

I was impressed with the way the ISEA board solicited and implemented our feedback, demonstrating the desire to arrange student travel scholarships and even allowing me a personal opportunity to work as a student liaison. Still, it appears that our field has inclusivity and notoriety to gain. In our scientific and public endeavors, we must accept the challenge to proliferate our specialties to inform decisions about equipment development and athlete testing. The Sports Technology Podcast (www.sportstechnologypodcast.com) and the ISEA newsletter are excellent examples of such exposure, but the playing field remains scant. By reaching out to these underrepresented groups, we may weave a continuous, value-driven thread from researchers-to-companies-to-end users, where all parties involved will amass benefits.

University of Southern Mississippi’s Sports and High Performance Materials (SHPM) group (left to right): Dr. Trent Gould, David Krzeminski, Nadine Lippa, Andrew Janisse, Dr. Scott Piland, James Goetz.
ISEA Invited Session

The 9th international symposium on computer science in sport (June 2013, Istanbul) will host an ISEA invited session. This is an opportunity to present the ISEA to a wider academic audience and find areas of common interest between the sports engineering and computer science and sport communities. The invited session features three Sports Engineers who will present their work in the area of sensors in sport – an area of interest to engineers and sports scientists. Details of the three presenters are below:

<table>
<thead>
<tr>
<th>Speaker</th>
<th>Presentation Title</th>
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<tbody>
<tr>
<td>Simon Choppin (session chair)</td>
<td>Consumer depth sensors for sport and biomechanics analysis</td>
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<tr>
<td>Lionel Manin (ISEA exec member)</td>
<td>The use of sensors to analyze, understand and optimize the dynamic behavior of sport material/equipment</td>
</tr>
<tr>
<td>Kerstin Witte</td>
<td>Development and Optimization of Sport Equipment by Integration of Measuring and Information Systems</td>
</tr>
</tbody>
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The invited session is an opportunity to present information about the ISEA as an organization, the Sports Engineering Journal as a home for published research and also the next ISEA conference in Sheffield, 2014. If you would like any more information about the invited session or have any suggestions, please contact Simon Choppin: s.choppin@shu.ac.uk

Coming Events for 2014

- The Engineering of Sport 10
  - Date: 14 - 17 July, 2014
  - Location: Sheffield Hallam University
  - Details: http://www.shu.ac.uk/research/cser/eos10.html

- iCSPORTS 2013
  - Date: 20 - 22 September, 2013
  - Location: Vilamoura, Algarve, Portugal
  - Details: http://www.icsports.org/