

**ISBS 2018 AUCKLAND HANS GROS EMERGING RESEARCHER KEYNOTE
LECTURE**

**SPORTS EQUIPMENT: HOW THE TRANSFORMATION FROM PASSIVE TO
DIGITAL SYSTEMS OPENS NEW DOORS AND PUTS NEW DEMANDS ON
SPORTS BIOMECHANISTS**

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The digital transformation of almost every aspect of our lives is probably the most radical change observed in human history. As part of this revolution, almost every piece of sport equipment can be instrumented with sensor technology now or in the future. The massive amount of data that can be generated by these systems can be utilized to help athletes to optimize their movement technique and load management and also offers great opportunities to perform research studies on a much larger scale, with a much better temporal resolution. Nonetheless, the widespread rise of digital feedback and measurement systems needs careful consideration of comparability, reliability and validity issues and puts new demands on the skills of sports biomechanists. During my talk I would like to highlight these challenges in a systematic way using examples coming from my own scientific work. This includes examples from instrumented starting blocks and reaction detection systems, sensor equipped running shoe insoles that monitor load and performance variables of their users and finally load monitoring systems used in team sports. I will discuss issues arising from the use of different sensor technologies and technical constructions, issues of comparing the results of novel systems with the existing body of knowledge in our field and challenges arising in data reduction and reporting. From this, I will briefly derive requirements for the education of sports biomechanists to allow for keeping up with and making ideal use of the opportunities involved in the transformation of sports equipment into digital systems.

KEY WORDS: digital, equipment, shoes, running, instrumentation, sensors