Sheffield Hallam University

Characterising player movement on hybrid football surfaces

How to apply

Applicants are requested to email a postgraduate application form (including a 1500 word proposal in section 9) to HWB-DoctoralAdmin@shu.ac.uk by 12 noon on Friday 24 February 2017.

Where English is not your first language, you must show evidence of English language ability to the following minimum level of proficiency: an overall IELTS score of 7.0 or above, with at least 6.5 in each component or an accepted equivalent. Please note that your test score must be current, i.e. within the last two years.

Please view our eligibility criteria before submitting an application.

Selection process

Successful applicants will be required to attend an interview where you will be asked to talk through your research proposal.

Project details

Director of Studies: Dr David James; second supervisors: Dr Marcus Dunn, Dr Ben Heller

Centre for Sports Engineering Research

External partner: adidas AG

Project description:

Professional football is increasingly played on hybrid surfaces that combine both natural and artificial turf. The majority of top league stadiums around the world now use a hybrid surface that weaves artificial fibres into the natural surface. It is claimed that hybrid surfaces are more consistent, more robust, and provide better drainage.

Despite their popularity in the professional game, relatively little is known about the effect of hybrid surfaces on player movement. Footwear is typically designed for, and tested on natural turf. Recently, adidas AG sponsored a programme of research undertaken by Sheffield Hallam University to better understand player movement on artificial turf (Emery et al. 2016). It was found that the player movements and footwear requirements on artificial turf were different to those on natural turf. The research informed the development of new surface specific footwear and methods to assess their 'real word' performance. The absence of knowledge on hybrid surfaces and the potential to develop new products to enhance player performance provides the motivation for this PhD proposal.

The general approach of the project will be to focus on field-based observations of match play football. In sports biomechanics research there is a growing consensus that simulated lab-based assessments often fail to elicit full match play intensity. This project will develop new methods (including the development of algorithms) to predict player kinematics and kinetics from multiple data sources including synchronised video, inertial sensor and GPS/LPS data. The Centre for Sports Engineering Research have developed considerable expertise in this area (Driscoll et al. 2015). The PhD will also involve a significant volume of fieldwork to establish and compare normative movement profiles for different footballers on natural turf, and hybrid turf.

The project is in collaboration with adidas AG, a global sporting brand with an excellent reputation for research and innovation. The results of the PhD will provide adidas AG with new knowledge and insights to develop new surface specific footwear for football.

A successful PhD candidate will be adept at developing excellent technical skills in fieldwork data collection with advanced data processing and predictive modelling methods. Furthermore, the PhD candidate will be confident in establishing strong working relationships with professional football teams, and the community of researchers at adidas AG. It is anticipated that the candidate will spend at least two months working in the research labs of adidas AG in Germany.

For further information, please contact Dr David James d.james@shu.ac.uk

References:

Emery, Jim, et al. "A Method for Characterizing High Acceleration Movements in Small-sided Football." Procedia Engineering 147 (2016): 718-723.

Driscoll, Heather, et al. "Measurement of studded shoe–surface interaction metrics during in situ performance analysis." Sports Engineering 18.2 (2015): 105-113.