

Sheffield Hallam University – Fédération Internationale de Football Association

Vice-Chancellor PhD Scholarship

Overview

The Sheffield Hallam University (SHU) Vice-Chancellor PhD scholarship scheme represents a prestigious opportunity for excellent students to conduct world-leading research in collaboration with key industry partners. SHU and the Fédération Internationale de Football Association (FIFA) have identified a significant and industry-wide challenge in the development and regulation of footballs, requiring in-depth understanding of football and turf interaction.

Project

As the world governing body of association football, FIFA's goal is to improve the football experience on and off the pitch. FIFA's Football Technology Innovation Department is tasked with ensuring that any changes to the game are evidence-based. The football-surface interaction represents a fundamental characteristic of the game, as this interaction shapes affordances (i.e. opportunities for action) presented to players when passing or striking the ball¹. However, and in comparison to other sports (e.g. golf, tennis), the understanding of football-surface interaction dynamics during match-play is limited. Further, industry-wide football sustainability challenges, including the use of recycled materials in sustainable football production² and the restriction of rubber crumb in artificial pitches³, highlight the importance of high-quality research in this area.

The Centre for Sports Engineering Research (CSER), an internationally renowned centre of excellence for research and knowledge transfer in the field of sports engineering, will support this PhD project through its world-leading research facilities and expertise on ball-surface interaction modelling. In this PhD, a series of field- and laboratory-based experiments will be performed using a range of footballs and surfaces. An advanced, numerical model of a football and surface interaction will then be obtained from this data set using appropriate data mining techniques. This model will then be used to simulate a range of typical football-surface interactions, to quantify the relationship between mechanical properties of the football and surface, as well as inbound and outbound trajectories. This PhD project will provide an excellent opportunity for the student to engage directly with relevant industry partners (e.g. FIFA), share research with relevant forums (e.g. FIFA Research Symposium, other relevant symposia), and inform future football governance on football-surface interaction.

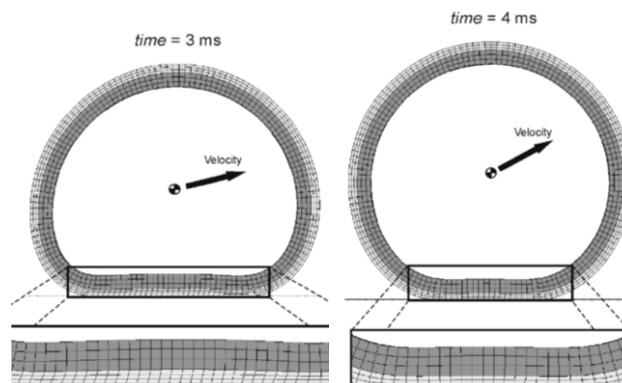


Figure 1. Cross-section of a modelled ball-surface impact (15m/s at 30°) at 3 and 4 ms of impact (adapted from Goodwill et al.⁴).

Funding information

Funding is available for UK Students, EU Students and International Students. A generous and comprehensive funding package is offered. Funding includes a stipend of £15,309 per annum (2020/21), Home/EU tuition fees (£4,414 in 2020/21) plus a generous travel, subsistence and equipment bench fee - supported by FIFA - of up to £1,500 per annum. For international students, a top up tuition fee of approximately £8,200 per year is required.

Entry requirements

Successful applicants will have attributes listed below:

- A good undergraduate degree (2:1 or higher) in a relevant subject (e.g. Sport Science, Sport Engineering, Mathematics, Computer Science).
- Either a Master's degree in a relevant area (e.g. Sport Science, Sport Engineering, Mathematics, Computer Science) or equivalent professional research experience.
- Where English is not your first language, you will have a strong proficiency in English (IELTS minimum overall score of 7.0 with at least 6.5 in each component).

The successful candidate would have experience of data mining with large data sets, be academically talented, be self-motivated, autonomous and have excellent problem-solving abilities. In addition, the successful candidate will also have excellent interpersonal skills and confidence in communication. The candidate will have experience in literature searching and reviewing, quantitative analysis and report writing. Desirable attributes would include professional or research experience in sports engineering, data handling and quantitative analysis.

Supervision and research training

The PhD supervision team comprises Dr Marcus Dunn, Dr Simon Goodwill, Dr Simon Choppin and Mr Johsan Billingham. Throughout your programme of study, you will be expected to identify and undertake a programme of training in research skills that is appropriate to your needs, to support your study.

Contact

Further information about the project please contact:

- Dr Marcus Dunn: m.dunn@shu.ac.uk | <https://www.shu.ac.uk/about-us/our-people/staff-profiles/marcus-dunn>
- Centre for Sports Engineering Research: www.shu.ac.uk/cser
- Advanced Wellbeing Research Centre: www.shu.ac.uk/awrc
- FIFA Football Technology: <https://football-technology.fifa.com>

Application process

Apply to SHU via the University application form, including a 1500-word research proposal (section 9) demonstrating your background reading on the topic of the PhD and your plans for you would undertake this programme of research. An application form can be downloaded at: <https://www.shu.ac.uk/study-here/how-to-apply/postgraduate/application-form>. For more information on the application process, contact HWLS-DoctoralAdmin@shu.ac.uk.

Key Dates

- Deadline for applications 10th July 2020
- Interviews will be held online, w/c 20th July 2020
- Studentship begins 1st October 2020

References

1. Pepping, G-J., Heijerikx, J. and de Poel, H. (2011). Affordances shape pass kick behaviour in association football: effects of distance and social context. *Revista de Psicología del Deporte*, 20(2), 709-727.
2. FIFA (2019). Environmental protection in the production of footballs. Last accessed 15th November 2019 at <https://football-technology.fifa.com/media/171899/environmental-protection-in-the-production-of-footballs.pdf>
3. Watterson, A. (2017). Artificial turf: contested terrains for precautionary public health with particular reference to Europe? *International Journal of Environmental Research and Public Health*, 14, 1050-1066.
4. Goodwill, S., Kirk, R. and Haake, S. (2005). Experimental and finite element analysis of a tennis ball impact on a rigid surface. *Sports Engineering*, 8, 145-158.