PGTA Project Proposal

Discipline:	Biomechanics and Motor Control
Project Title:	A novel dual task instrumented concussion assessment
Supervisory Team:	Dr Michael Grey Dr Dale Esliger VR expert from either SSEHS or Advanced VR Research Centre
Summary of proposed project:	 Diagnosing a concussion and promptly removing the concussed athlete from play is essential to prevent exacerbation of the injury and reduce the risk of further neurological damage. Continuing to play can lead to severe complications, including the rare but fatal Second Impact Syndrome. Moreover, undiagnosed concussions can have long-term implications on an athlete's health and performance. Balance and, more recently gait assessment, has been added to more traditional cognitive function and memory tests to aid the diagnosis of concussion. Most recently dual-task assessments have been shown to be effective – the participant is required to walk whilst counting backwards from 100 by 7. However, at present the assessment of tasks is neither robust nor repeatable because it relies on a clinician
	The proposed PhD project will develop and assess a new objective concussion assessment tool. This tool will be able to be used by non-clinicians at the pitch side and include more complex assessments that will be useful to the clinician in the A&E and the clinic. We will use Inertial Measurement Units (IMUs) to measure specific features of balance and gait (e.g. centre of pressure, gait stability, gait symmetry), thus providing an objective measure. We will use Virtual Realty to introduce a more sophisticated set of dual task paradigms than is currently available, for example the Stroop task.
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	Figure 1. Dr Grey has previously implemented a dual-task balance assessment that was assessed by West Bromwich Albion FC and highlighted on BBC News.
Required skills, experience, and/or education:	Good inter-personal skills, experience in teaching, Biomechanics, Engineering, Motor Control or a related field. First Class Degree or Master's degree in a related field
Link to School research theme:	 Sport Performance Lifestyle for health and wellbeing Will also link the National Rehabilitation Centre