

Participant Information Sheet (Research)

You are being invited to take part in research on the measurement of heading in football. Thomas Aston, PhD researcher at the University of Edinburgh is leading this research as part of their PhD studies. Before you decide to take part, it is important you understand why the research is being conducted and what it will involve. Please take time to read the following information carefully.

What is the research about?

- To better understand the effects that contact sports such as football and rugby have on the brain, technologies which measure the speeds and accelerations associated with head impact have been developed. However, these technologies (such as the instrumented mouthguards recently introduced in the 2024 Six Nations tournament) lack key contextual information surrounding the impact such as impact type and player body position.
- This research work therefore aims to assess the feasibility of an approach which harnesses Artificial Intelligence (AI) technology to automatically extract impact data directly from video footage, without instrumentation or markers. The accuracy of the technology will be assessed by comparing with measurements obtained using a traditional marker-based motion capture approach.

Why have I been invited to take part?

- You are invited to participate in this study because you are an actively participating football player with Edinburgh University Association Football Club, Edinburgh University Women's Association Football Club or similar.
- Please ensure you comply with the inclusion and exclusion criteria below:
 - Inclusion criteria:
 - You have at least 5 years of experience playing for a football club (amateur, semi-professional, university level and/or professional).
 - You are in good health with no evidence of any recent pre-existing injuries to include concussion / suspected concussion.
 - You are aged 18 years or older
 - You have headed a ball 10 or more times in at least one game in the last 5 years
 - Exclusion criteria:
 - You are on a rest period following an injury (including concussion or suspected concussion)
 - You have sustained a concussion in the last year.
 - You have any skin condition or allergy to adhesives (e.g. that used for double sided tape) or that affects the skin.
 - You have a history of brain injury resulting in loss of consciousness
 - You have a history of a neurological condition
 - You have a family history of epilepsy or aneurysms
 - You use psychoactive recreational or prescription drugs.

What will I be asked to do?

- Each participant will be asked to perform a routine football heading drill in a motion capture laboratory. Reflective markers will be placed on participants in the locations shown in Figure 1, to allow the position and orientation of the head to be tracked.

- You will then be asked to perform three sets of five headers (15 headers in total) spread out over the course of one hour. In each set, the angle of a target relative to the direction you are facing will be adjusted, so that your range of motion during the headers varies from linear (aiming your header in the same direction as the ball's travel) to rotational (aiming your header at 90 degrees to the direction of the ball's travel).
- The ball speed will be similar to that of a corner kick, and will be controlled by a football launcher.

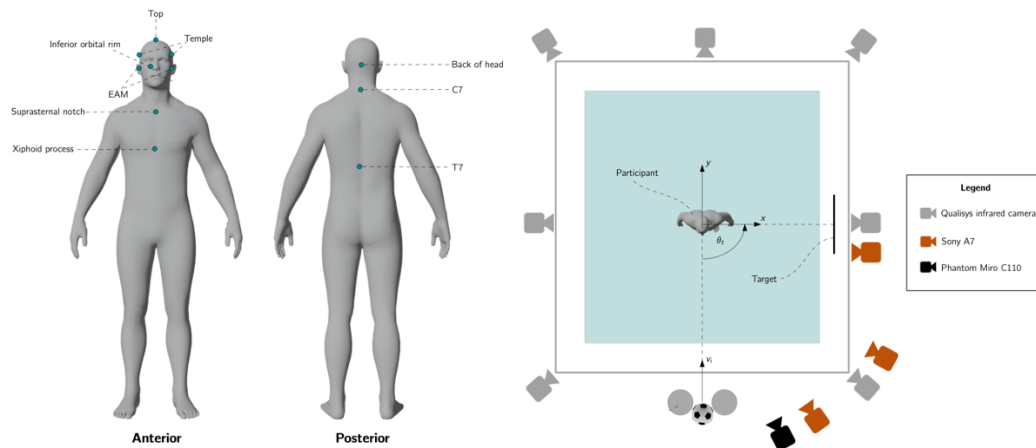


Figure 1: (Left) Reflective marker locations. (Right) Diagram of laboratory setup: three sets of five heading actions will be performed, each with varying angle to target.

What are the potential risks?

- There is a possibility of an unintentional injury due to incorrect header technique (e.g. facial injury). However, the heading drill has been designed to be low risk, mimicking what would typically be performed at a football training session.
- To ensure this risk is further minimised, you will perform a suitable warm-up involving football and heading specific movements to prepare the body for optimal coordination during the drill. If at any point you feel distressed, nauseous or otherwise unhappy with the exercises you should stop immediately and just explain why to a member of the research team.
- There is no known case of a player sustaining a concussion by performing multiple headers. However, you will be made aware of the signs and symptoms of concussion on the day of the trials due to the study involving impact to the head. You will also be instructed to report any strange feelings during the trials to the research team.
- To further minimise risk you will be asked to complete a medical screening questionnaire prior to testing.

What are the potential benefits?

- Whilst there are no direct benefits to taking part in this research, with this research we hope to improve head impact measurement technology in sport, leading to eventual improvements in safety of contact sport going forward.

Do I need to take part?

- Your participation in this study is entirely voluntary. If you wish to withdraw, you can do so at any time without providing any reason. If you withdraw then we will give you the opportunity to request any

data already collected destroyed. However, whilst we will endeavour to comply with this, it may not be possible if doing so would seriously impair the achievement of the research purpose.

What will happen to the information collected?

- The lead researcher (details below) should be your first point of contact if you have any queries regarding the handling of your information. If you have any complaints these can be made to the Researcher's supervision (details below).
- The data for this research are collected under public task. The University's Data Protection Policy can be found at: <https://www.ed.ac.uk/records-management/policy/data-protection>

Screening information

- You will be asked to provide health screening information including certain medical information. This is necessary to screen potential participants to ensure that there are no indications that you could be exposed to excessive risk by taking part in the study. These data will be solely used for this purpose and the records of these data will only be identified by a unique participant number, be stored securely and separately from the rest of the study information. These records will be securely disposed of after 12 months.
- In addition to data-protection law, the handling of these data are also covered by Common Law Duty of Confidentiality. Processing these data will be conducted in accordance with the additional requirements detailed in Article 89(1).

Research data

- Video data will be stored in MP4 or AVI. Image data will be stored in JPEG, PNG or TIFF. Motion data will be stored in excel/database style formats. All electronic data (including video data) will be stored on encrypted drives on password protected university computers and temporarily on encrypted and password protected external storage devices (USB and Hard Drive devices). All data will be uploaded to the secure University server as soon as practicable after data collection and permanently deleted from the abovementioned external storage devices. The results of the research will be published in academic journals and conference proceedings. If an image or video clip is used at a conference or in a published paper, the image will have your face and any distinguishable features (e.g. tattoos) pixelated/obscured. You will not be identified in any publication.
- Your data will be processed in accordance with Data Protection Law. All information collected about you will be kept strictly confidential.
- Your name will not be stored alongside your research data which will only be identified by a unique participant identifier.
- All electronic data will be stored on systems that allow access to the data to be restricted to those involved with the research (see footnote¹) and all paper records will be stored in a locked filing cabinet.
- Your data will only be viewed by the researcher/research team. This includes researchers based at Ulster University and Trinity College Dublin.

• With some of the Institute's data collection systems, this cannot currently be complied with . The Technical Services Team are working to resolve these issues but researchers may be required to take additional precautions. There is advice and details of the affected systems on the sections of the Lab Skills Course relating to the relevant equipment.

Changes to research project

- In the event of any changes being made to the research that would require modification to the information given in this sheet, the amended Participant Information website will be placed upon the Institute's website. Any such changes will be restricted to the use of the data for amended or
- additional research purposes and will not reduce the stated level of protection given to your data.

Contact information

Lead researcher: First point of contact for enquiries relating to the research

Telephone No. +44(0)7760433401

email address thomas.aston@ed.ac.uk

Research Supervisor¹: Person to contact in the event of a complaint

Telephone No. +44(0)131 6506768

email address f.teixeira-dias@ed.ac.uk

University's Data Protection Officer: University's contact for data-protection queries that cannot be addressed by researchers conducting study.

email address dpo@ed.ac.uk

• ¹For students, this is the dissertation course organiser, for staff, this will be an appropriate senior person