

# Elizabeth Ann Gandy

## PhD Doctor of Philosophy

### Title.

Visualising inertial motion sensor data: the design and evaluation of a horse rider assessment interface

### Thesis Outline.

This project will design and evaluate an inertial motion sensor (IMU) based screening and feedback tool for the automated postural assessment of horse riders, leveraging data visualisation techniques appropriate for use in the wild. Research will seek to determine an appropriate protocol for the collection of rider postural data, identify the key biomechanical measures required for postural assessment of the rider and select data visualisation techniques that are most appropriate for providing feedback to the user in the wild, taking account of multiple contexts of use. This will provide equestrian practitioners with a computer-based solution to improve consistency and provision of feedback in rider postural analysis.

### Biography.

I graduated from the University of Durham with a BSc (Hons) in Mathematics in 1989 and an MSc in Computing in 1993. I worked as a software engineer in the pipeline inspection industry for seven years before taking up my current role as a senior lecturer in the School of Computer Science at the University of Sunderland in 2000. As a disabled horse rider, I have experienced first-hand the issues of asymmetry and this has led me to focus my research on the development of software tools to support the use of technology for postural assessment of horse riders.

### Research Activities.



**Elizabeth Ann Gandy**

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Technology

### Director of Studies.

[Professor Sharon McDonald](#)

Development of software tools to support the use of technology for the visualisation of motion analysis data. Whilst my primary focus is on the application of data visualisation techniques for automated biomechanical analysis within the equestrian field, I also have an interest in how these techniques may have a broader impact in other sporting and health contexts. Previous work, in collaboration with physiotherapists, coaches and equestrian practitioners, has included investigation of the potential of the Xsens MVN inertial motion capture suit ([www.xsens.com](http://www.xsens.com)) for the measurement of hip angle and pelvic orientation in the assessment of asymmetry in riders.

## Citations And Presentations.

Journal Articles: Roost, Linda, Ellis, Andrea D., Morris, Catherine, Bondi, Anne, Gandy, Elizabeth, Harris, Patricia and Dyson, Sue (2019) The effects of rider size and saddle fit for horse and rider on forces and pressure distribution under saddles: a pilot study. *Equine Veterinary Education*. Gandy, Elizabeth, Bondi, Anne, Pigott, Timothy M. C., Smith, Gary and McDonald, Sharon (2018) Investigation of the use of inertial sensing equipment for the measurement of hip flexion and pelvic rotation in horse riders. *Comparative Exercise Physiology*, 14 (2). pp. 99-110. ISSN 1755-2540 Gandy, Elizabeth, Bondi, Anne, Hogg, Robert and Pigott, Timothy M. C. (2014) A preliminary investigation of the use of inertial sensing technology for the measurement of hip rotation asymmetry in horse riders. *Sports Technology*, 7 (1-2). pp. 79-88. ISSN 1934-6182 Conference Presentations: Gandy, Elizabeth, McDonald, Sharon, Hogg, Robert and Pigott, Timothy M.C. (2017) Observing the Observer: experiences with contextual inquiry to design a horse rider assessment interface. In: *British HCI 2017 Conference Digital Make Believe*, 3-6 Jul 2017, Sunderland, UK.