Science Bridges China Research Profile

Name: **Dr John Buckley**

Position: **Reader in Movement Biomechanics**

Institute/division: **Vision and Mobility/Biomechanics Research Laboratory**

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SUMMARY OF MY RELEVANT RESEARCH AREAS:

Vision and locomotion; biomechanical adaptations and/or compensatory mechanisms associated with musculo-skeletal abnormalities, problems or dysfunction, and sensory impairment; lower-limb prosthetic design and biomechanical characterisation

视觉和运动行为;生物力学的适应， 和/或与肌肉骨骼异常，问题或功能障碍，感觉异常相关的补偿机制；下肢假肢的设计和生物力学特性

Primary Research interests:

Recent projects include: Impact of correctable visual impairment upon balance and locomotion in older adults (Health Foundation Fellowship); Features to enhance sensorimotor control in order to gain full advantage of improved lower-limb prosthetic design (EPSRC); Manipulating the appearance of steps and stairs to make them safer for older people to negotiate (NIHR).

Topics in which you would like to develop collaborative research:

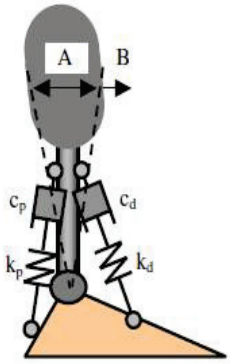
Locomotion; prosthetic design and biomechanical characterisation; biomechanical modelling; rehabilitation; assessment technologies

Relevant existing collaborations (academic/clinical/commercial) inside or outside China.

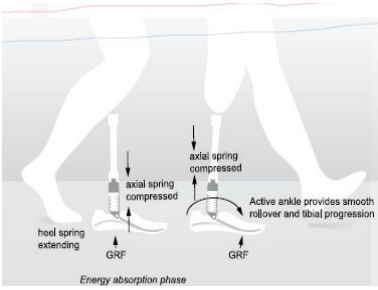
UK: Research Institutes in Human Movement Sciences, Liverpool and Manchester. North America: Waterloo University, University of North Carolina at Greensboro. Industry: long standing collaboration with Chas A Blatchford's and Sons Ltd (specialist manufactures of artificial limbs).

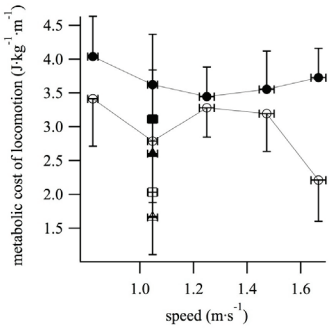
Relevant graphics, figures, pictures:

Biomechanical characterisation of prosthetic foot with hydraulic ankle articulation device versus rigid ankle

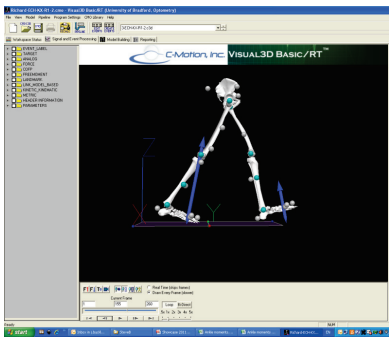


Schematic of hydraulically controlled ankle articulation device

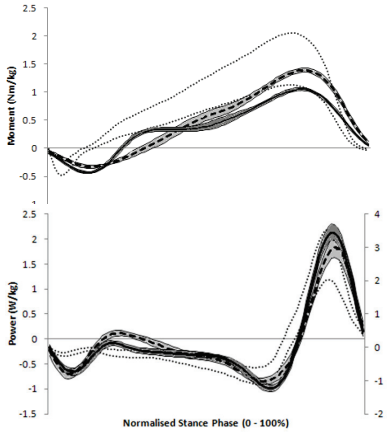




Metabolic energy cost of walking at various speeds using hydraulic ankle articulation device (open symbols) versus rigid ankle (solid symbols) at 0% (circles), 5% (triangles) and 10% (squares) decline.



Biomechanical modelling of data collected via 3D motion capture



External moment and mechanical power at distal end of shank (mean ± SD across 10 trials) when using hydraulic ankle articulating device (dark shading) versus fixed ankle (light shading).

Publications and other outputs relevant to your interest in this programme

- Buckley JG, Cooper G, Maganaris CN, and Reeves ND. Is stair descent in the elderly associated with periods of high centre of mass downward accelerations? In review Journal of Experimental Gerontology.
- De Asha AR, Johnson J, Munjal R, Kulkarni J, and Buckley JG. Attenuation of centre-of-pressure trajectory fluctuations under the prosthetic foot when using an articulating hydraulic ankle attachment compared to fixed attachment. In review Clinical Biomechanics.
- Timmis M, and Buckley JG. (2012) Obstacle crossing during locomotion: Visual exproprioceptive information is used in an online mode to update foot placement before the obstacle but not swing trajectory over it. Gait & Posture; 36(1): 160-162.
- Pohl MB, Messenger N, Buckley JG. (2006) Changes in Foot and Lower Limb Coupling Due to Systematic Variations in Step Width. Clin Biomech. 21(2): 175-83.
- Buckley JG. (2000) Biomechanical adaptations of transtibial sprinting in athletes using dedicated prostheses Clinical Biomechanics, 15(5): 352-358.