**Joe Marshall – Full List of publications**

**Introduction**

My research into thrill technologies is at the centre of the University of Nottingham's 30 million pound Horizon Digital Economy Research Institute, a major strategic initiative under its 'operations in a digital world' priority. The 'Day in the Park' project which included my work is Horizon's flagship project in terms of both academic publications and wider impact.

I was recently granted a Leverhulme Early Career Fellowship, with the title 'Interaction in Motion'. This prestigious 3.5 year personal fellowship will allow me to study the new territory of the design of mobile devices and software for active use during a wide range of movement activities, from walking in the street, to extreme sports performed in harsh environments.

My work has had a wide impact, including written publications in quality venues, high profile print and television media coverage and has led to successful commercial collaborations. This document lists these various publications.

**Written Publications (all peer reviewed)**

In the field of human computer interaction (HCI), good peer reviewed conferences such as those sponsored by ACM, are of equal or greater importance than journal articles. In particular, the ACM SIGCHI Conference on Human Factors in Computing Systems (ACM CHI) is considered the premier publication venue for HCI work and is more prestigious than HCI journals. Full papers in ACM CHI are chosen using a rigorous double blind review process including 4 reviewers and a rebuttal phase. The acceptance rate is typically 20-25%.
Because my work is interdisciplinary in nature, I have also targeted high quality journals in the arts and humanities such as Leonardo Journal.
Much of this work is part of larger collaborations, for multi-author papers, I follow the reference with an estimate of the percentage of the work that was mine in square brackets.
A selection of my most significant work is highlighted and has a * in the left margin.
Work which has undergone an academic peer review process is marked with **(PR)** in the margin.


***(PR)** Benford,S., Greenhalgh, C., Giannachi, G., Walker, B., Marshall, J., Rodden, T. 2012, Uncomfortable Interactions. *Proceedings of CHI 2012: ACM SIGCHI Conference on Human Factors in Computing Systems*, ACM, New York, NY, USA 2005-2014 [15%]
This paper, which combines a variety of work in the Mixed Reality Lab including mine, was awarded a prestigious best paper award, awarded to the top 1% of submissions at ACM CHI.

**(PR)** Tennent, P., Reeves, S., Benford, S., Walker, B., Marshall, J., Brundell, P., Meese, R., Harter, P. 2012, The Machine in the Ghost: Augmenting Broadcasting with Biodata. *Proceedings of alt.chi 2012, Extended Abstracts of the ACM SIGCHI Conference on Human Factors in Computing Systems*, ACM, New York, NY, USA [20%]

***(PR)** Marshall, J, Benford, S., 2011. Using fast interaction to create intense experiences. *Proceedings of CHI 2011: ACM SIGCHI Conference on Human Factors in Computing Systems*, ACM, New York, NY, USA 1255-1264 [90%, main author]

***(PR)** Marshall,J., Rowland, D., Rennick Egglestone, S., Benford, S., Walker, B., McAuley, D. 2011. Breath control of amusement rides. *Proceedings of CHI 2011: ACM SIGCHI Conference on Human Factors in Computing Systems*, ACM, New York, NY, USA 73-82 [75%, main author]

**(PR)** Marshall, J., Walker, B., Benford, S., Tomlinson, G., Rennick Egglestone, S., Reeves, S., Brundell, P., Tennent, P., Cranwell, J., Harter, P., Longhurst, J., 2011. The gas mask: a probe for exploring fearsome interactions, *Proceedings of alt.chi 2012, Extended Abstracts of the ACM SIGCHI Conference on Human Factors in Computing Systems*, ACM, New York, NY, USA 127-136 [80%, main author]

***(PR)** Marshall, J., Chamberlain, A., Benford, S., 2011. I Seek the Nerves under Your Skin: A 'Fast' Interactive Artwork. *Leonardo*. 44(5), MIT Press, Cambridge, MA, USA 401-404 [90%, main author]

**(PR)** Sheridan, J., Bryan-Kinns, N., Reeves, S., Marshall, J., Lane, G., 2011. Graffito: crowd-based performative interaction at festivals. *Extended Abstracts of the ACM SIGCHI Conference on Human Factors in Computing Systems*, ACM, New York, NY, USA 1129-1134 [20%]

**(PR)** Chamberlain, A, Oppermann, L., Flintham, M., Benford, S., Tolmie, P., Adams, M., Row-Farr, J., Tandavanit, N., Marshall, J., Rodden, T., 2011. Locating experience: touring a pervasive performance. *Personal Ubiquitous Computing*. 15, Springer, London 717-730 [10%]

**(PR)** Rennick Egglestone,S., Whitbrook, A., Leygue, C., Greensmith, J., Walker, B., Benford, S., Schnädelbach, H., Reeves, S., Marshall, J., Kirk, D., Tennent, P., Irune, A., Rowland, D. 2011. Personalizing the Theme Park: Psychometric Profiling and Physiological Monitoring. *Proceedings of User Modeling, Adaptation and Personalization 2011*, Springer, London 281-292 [10%]

**(PR)** Tennent, P., Rowland, D., Marshall, J., Rennick Egglestone, S., Harrison, A., Jaime, Z., Walker, B., Benford, S. 2011. Breathalising games: understanding the potential of breath control in game interfaces. *Proceedings of ACE 2011: 8th Advances in Computer Entertainment Technology Conference*, ACM,New York, NY, USA 58:1-58:8 [30%]

**(PR)** Rennick Egglestone, E., Walker, B., Marshall, J., Benford, S. McAuley, D. 2011. Analysing the Playground: Sensitizing Concepts to Inform Systems That Promote Playful Interaction. *Proceedings of INTERACT 2011*. Springer, London. 452-469 [30%]

**(PR)** Oppermann, L., Flintham, M., Reeves, S., Benford, S., Greenhalgh, C., Marshall, J., Adams, M., Row-Farr, J., Tandavanitj, N. 2011 Lessons from Touring a Location-Based Experience. *Proceedings of Pervasive 2011, the Ninth International Conference on Pervasive Computing*: 232-249 [10%]

***(PR)** Marshall, J., Benford, S., Pridmore, T., 2010. Deception and magic in collaborative interaction. *Proceedings of CHI 2010: ACM SIGCHI Conference on Human Factors in Computing Systems*, ACM, New York, NY, USA 567-576 [90%, lead author, ]

**(PR)** Marshall, J., Airantzis, D., Angus, A., Bryan-Kinns, N., Fencott, R., Lane, G., Lesage, F., Martin, K., Roussos, G., Taylor, J., Warren, L., Woods, O., 2010. Sensory Threads. *Leonardo*. 43(2), MIT Press, Cambridge, MA, USA 196-197 [70%, lead author]

**(PR)** Rowland, D., Porter, D., Gibson, M., Walker, K., Underwood, J., Luckin, R., Smith, H., Fitzpatrick, G., Good, J., Walker, B., Chamberlain, A., Rennick Egglestone, S., Marshall, J., Schnädelbach, H., Benford, S. 2010 Sequential art for science and CHI. *Proceedings of alt.chi 2010, Extended Abstracts of the ACM SIGCHI Conference on Human Factors in Computing Systems*, ACM, New York, NY, USA 2651-2660 [5%]

**(PR)** Rennick Egglestone, S., Whitbrook, A., Greensmith, J., Walker,B., Benford, S., Marshall, J., Kirk, D., Schnädelbach, H., Irune, A., Rowland, D.. 2010: Recommending Rides: Psychometric Profiling in the Theme Park. *Computers in Entertainment* 8(3): 21 ACM, New York, NY, USA [10%]

**(PR)** Marshall, J., 2009. I seek the nerves under your skin, *Proceedings of ACM Creativity and cognition 2009*, ACM, New York, NY, USA 477-478 [100%, lead author]

**(PR)** Stefan Rennick Egglestone, Joe Marshall, Brendan Walker, Duncan Rowland, Steve Benford, Tom Rodden, 2009. The Bronco: a proof-of-concept adaptive fairground ride *Proceedings of the International Conference on Advances in Computer Entertainment Technology, ACM ACE 2009*, ACM, New York, NY, USA 371-374 [35%]

**(PR)** Bryan-Kinns, N., Airantzis, D., Angus, A., Fencott, R., Lane, G., Lesage, F., Marshall, J., Martin, K., Roussos, G., Taylor, J., Warren, L., Woods, O. 2009. Sensory Threads: Perceiving the Imperceptible. *Proceedings of 5th International Conference on Intelligent Environments (IE'09).* IOS Press, Amsterdam, Netherlands 404-410 [10%]

***(PR)** Rowland, D., Flintham, M., Oppermann, L., Marshall, J., Chamberlain, A., Koleva, B., Benford, S., Perez, C. 2009. Ubikequitous computing: designing interactive experiences for cyclists in *Proceedings 11th International Conference on Human-Computer Interaction with Mobile Devices and Services. MobileHCI09*. ACM, New York, NY, USA 21:1-21:11 [20%, Mobile HCI is the premier conference for publishing specialised work on mobile interaction]

***(PR)** Marshall, J. Pridmore, T., Pound, M., Benford, S., Koleva, B. 2008. Pressing the Flesh: Sensing Multiple Touch and Finger Pressure on Arbitrary Surfaces, *Proceedings of Pervasive 2008, Sixth International Conference on Pervasive Computing*, Springer, London. 38-55 [90%, lead author]

**(PR)** Marshall, J. Benford, S., Pridmore, T. 2008. Eye-Balls: Cheap and Cheerful Interactive Performance. Leonardo. 41(3), MIT Press, Cambridge, MA, USA 304-305 [90%, lead author]

**(PR)** Marshall, J., 2007. Eye-balls: computer vision in the circus. *Proceedings of ACM Creativity & Cognition 2007*, ACM, New York, NY, USA [100%, lead author]

**(PR)** Henrysson, A., Marshall, J., Billinghurst, M. 2007. Experiments in 3D interaction for mobile phone AR. *Proceedings of 5th International Conference on Computer Graphics and Interactive Techniques in Australasia and Southeast Asia*, ACM, New York, NY, USA 187-194 [45%]

**(PR)** Marshall, J. Mills, S., Benford, S. 2006. Using Object Interactions to Improve Particle Filter Performance. *Proceedings of British Machine Vision Conference*, BMVA Press, Manchester, UK 337-346 [90%, lead author]

## Software

* Vicarious Software Architecture (2010-2012)
The Vicarious Software Architecture is a piece of software that has been developed over the last two years. I have led the technical work in collaboration with Paul Tennent, doing a roughly equal quantity of the design and development work. Vicarious provides a framework for the development of experiences which use physiological sensing equipment, and the visualisation of these sensor signals, along with video processing and capture. This has been deployed by us for a wide range of experiments and events, and is now being used by other groups for their work. The following is a brief list of selected work done with Vicarious.

- The technical basis of all experiments performed in the major Vicarious project within the Horizon Digital Economy Research Institute.
- Used in School of Computer Science - 4 undergraduate projects have used the system so far, and 2 PhD students are using the system.
- Starting to be used by external groups for experiments (Virtual Environments group at University College London, Human Computer Interaction Group at Technische Universität Wien, Austria).
- Used for live events such as Cheltenham Science Festival and University Mayfest.
- Enabled us to successfully run several consultancy projects, including TV pilots, PR events (London Dungeons), invited live experiments (Food Design Conference), and a £24,000 project with Nissan, to study and measure the thrill of driving using physiological sensing, whilst also using the recorded sensor data to provide visualisations for a major advertising campaign to support their Nissan Juke vehicle.

## Events & Exhibitions of Individual Work (PR if application process was peer reviewed)

Several of my projects, including all my PhD work, have involved the creation of technology for artistic performances and interactive artistic installations. This technology is then studied by exposing it to large public audiences and studying their responses to the technology.
This section lists selected events and exhibitions of my individual work.

**(PR)** Creativity and Cognition, Berkeley, CA, USA 2009. I seek the nerves under your skin. Presentation of an interactive movement controlled poem to 40 participants and 200 audience.

**(PR)** (re)Actor3, Contemporary Urban Centre, Liverpool, UK, 2008. I seek the nerves under your skin. interactive movement controlled poetry – approximately 30 participants, 100 audience.

Twaddle Cabaret, Derby, UK, 2007. Rock installation – interactive 'pet rock' installation demonstrating novel computer vision based touch sensing technology that I developed, shown as a sideshow at a Cabaret evening to an audience of approximately 100 people.

**(PR)** (re)Actor2, Leeds, UK, 2007 Rock Installation: shown as part of art exhibition, to an audience of approx 100 people. Awarded a prize for best installation.

Design Camp 8, Wanganui, New Zealand, 2007: Juggling Tracker – computer vision based performance system that tracks juggling balls and creates visualisations and music in response to the movement of the balls. Performance using the system to an audience of 500.

GameCity Festival, Nottingham, 2007: Juggling Tracker public demonstration and have a go session, approximately 50 participants.

## Collaborative Events, Exhibitions and TV Productions

The research I have been involved in has achieved an extremely high level of public impact, through public events, exhibitions, TV and print media coverage etc. The 'thrill technologies' thread of work in which I have been involved is shortlisted to be a featured impact case study in

the school's REF 2014 return. This work has also brought in significant consultancy work for the University. This section describes selected events, exhibitions and TV productions which I was involved in. As these were collaborative efforts, I have listed my input as a percentage, and whether I was the main organiser, as in the main publications list. I also list estimated audience and participant figures where applicable.

Uni of Nottingham, Alton Towers (2012). Consultancy work to study rider's physiological responses to the new ride 'Nemesis Subterra' for their print and radio PR campaign (coverage in The Times, Metro, The Sun, BBC Radio etc.) [50%, approx 10 million audience]

Uni of Nottingham, Mayhem Horror Film Festival, Confetti Institute of Creative Technologies: *The Experiment Live* (2011). Live cinema transmission of video, audio and physiological data of 4 'paranormal investigators' exploring a purportedly haunted cellar beneath a central Nottingham location and carrying out a seance. [20%, approx 100 audience (a sold out cinema)]

Uni of Nottingham,: *PerPing (2011)*. A gas mask / breathing controlled tennis game, run at Cheltenham Science Festival (and various other places) [33%, approx 500 participants]

Uni of Nottingham, Thorpe Park: *Gas masks at Saw Alive (2010)*. Running an experience involving members of the public wearing breath sensing gas masks in the Saw Alive horror maze at Thorpe Park. [33%, 16 participants]

Aerial, Uni of Nottingham: *Breathless: An Interactive Ride Experiment* (2010): Software development and design work on breath controlled swing ride, using breath sensing gas mask interface. [40%, 40 participants]

Uni of Nottingham, Mayhem Film Festival: *Hyperventilation* (2010). Experience sensing the breathing of gas mask wearing horror film watchers and projecting this to an audience outside the film. [25%, 4 participants, approx 100 audience]

*Uni of Nottingham: *Bucking Bronco Adaptive Ride Experiment Number 2*: I built an interactive ride experience, designed the experiments, and led a team of people running the ride at various venues in Nottingham, including the GameCity Festival. (2009-present) [90%, lead developer, 200+ participants]

BigDog Interactive, University of Nottingham, University of Glasgow: *Graffito* – live shared drawing mobile phone experience, shown on a large screen at 'Vintage at Goodwood' music festival (2010) [25%, approx 100 participants, 6000 audience]

Proboscis and various – technical & design work on outdoor interactive art experience '*Sensory Threads*', which created an audio soundtrack based on body worn sensors detecting various aspects of the world surrounding participants (shown at ACM CHI 2010) [25%, approx 20 participants]

Aerial, University of Nottingham: *Bucking Bronco Adaptive Ride Experiment No.1* at EPSRC Pioneers event, Earls Court, London (2009). [25%, approx 20 participants]

Blast Theory, University of Nottingham: *Rider Spoke,* Software development and technical support on the bicycle based interactive art performance 'Rider Spoke' by Blast Theory, shown at the Barbican in London and in Athens (2007-2008) [10%, approx 400 participants, coverage in national press]

Australian Centre for the Moving Image, Melbourne, Australia: Software development work and installation of real time motion capture experience to accompany the touring Pixar Studios exhibition (2007). [ 80%, lead developer, several thousand participants]

**Media Coverage**

*Discovery Channel: *Daily Planet* (2011): Feature on our Thrill technology work, focusing on my interactive Bucking Bronco ride [75%, lead developer - 7 million+ audience]

Inventorspot.com (2011): Article on Bucking Bronco ride [90%, audience approx 20,000]

The Times, UK, (2010): Feature on Bucking Bronco ride [25%, audience approx 500,000]

The Guardian, Science Weekly (Nov'10). "Testing fear, panic and arousal in cinemagoers". Our experiment Hyperventilation was featured in the Guardian's weekly online podcast. [20%]

BBC TV (The One Show, Bang Goes the Theory, Blue Peter), Thrill Laboratory experiments – consultancy work in which we put various TV presenters onto rollercoasters along with physiological sensing equipment, and demonstrated how the rides affected their physiology (2008-2010) [40%, audiences from 100,000 – 4 million]

BoingBoing.net (2009): Article on Bucking Bronco ride [25%]

New Scientist Online (2008): Article and video of touch sensing technology developed during my PhD [100%, audience of approx 80,000]

## Invited Talks

- Glasgow School of Computer Science, 'Interaction and Theme Park Rides'.
- Canonical Ltd, London, 'Deception in Interaction Design'
- BBC R&D Salford jointly with Paul Tennent, 'Vicarious' (description and demonstration of the Vicarious Software Architecture.
- Design Camp 8, Wanganui, New Zealand talk and demonstration of my computer vision based juggling tracking system.

## Commercial Exploitation of Research

I am 50% of the core team (with Paul Tennent) who developed the Vicarious Software Platform, which is being used for a large number of commercial engagements, including a 9 month collaboration with Nissan to study the thrill of driving, in support of the promotional campaign for their 'Nissan Juke' vehicle (see publications section for more information on Vicarious).

I have also been involved in several events as a member of Thrill Laboratory, a consultancy brand run by Aerial and the Mixed Reality Lab which performs theatrical 'experiments' using physiological sensing equipment. We have worked for major clients such as BBC Blue Peter, Alton Towers, Thorpe Park, Lions Gate Entertainment.