

***Swing That Thing...* Cross-pollinating Art, Design and Science to Develop and Evaluate Sensory Augmentation & Body Memory Technology**

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ABSTRACT

Swing That Thing : Moving to Move is a practice-based fine arts doctoral investigation that sits within the context of empirically-driven research into wearable technical- and intelligent-textile devices for human performance advancement. The research generates soft outcomes through art and design ideation techniques that complement the development and application of increasingly rigorous evaluation techniques to characterise the subjective experience of using sensory augmentation technology. The approach generates new opportunities to observe and evaluate language, communication, idiosyncrasy, interaction and the phenomenological notion of the body as the seat of experience. New avenues of philosophical and psychological enquiry into cognition and perception are thus uncovered. The research project is introduced and the research context discussed. Evaluation in relation to subjective experience is commented upon, and the advantage of undertaking Art, Design and Science research in close proximity proposed.

INTRODUCTION

The *Swing That Thing...* research project examines how interactive technology in, on and around the body might be used to *poeticise* experience¹. Practical outcomes, including interactive concept garments and body extensions that encourage people to explore and move in playful ways, have evolved from a common design intent: “to move the body through real and virtual extension”. By extending the body mechanically, gesturally and sensorially we can encourage people to move in extra-normal ways and so view and experience their bodies from perhaps hitherto unknown perspectives. This affords insight into how our bodies can move and what this might feel like with others. It is a method of sharing that also affords insight into individual learning preferences and the idiosyncratic nature of personal, corporeal expressiveness. The work examines whether, through artful application of technology to the body, we might uncover and encourage our expressive and poetic potential.

RESEARCH CONTEXT : MIXING ART, DESIGN AND SCIENCE

The research is being undertaken at Monash University Faculty of Art and Design, in the Department of Fine Art, where research focuses on art, design and body theory, traditional fine art practices and performance art. It is also informed by the author’s Masters research at the Royal College of Art Department of Interaction Design, in London, UK, as well as critical art and design research in academic and non-academic contexts around the world.

Co-supervision, to provide a science and engineering context, is provided by Dr Richard Helmer at the CSIRO, Australia’s Commonwealth Scientific and Industrial Research Organisation. Dr Helmer leads the Advancing Human Performance Theme, which includes championing the development of wearable interactive textile systems and garments for a range of applications in sport, entertainment and health. The main driver of this research is to move from traditional hard electronics to a combination of hard and soft electronics in garments and on the body, with the

¹ <http://tinyurl.com/SwingThatThing>

knowledge that new devices can enable new information, experiences and engagement in new environments. The group is developing a suite of textile based wearable technologies for sensing limb movement, pressure, impact, moisture, and the electrical activity of the body using advances in new materials that when combined with digital infrastructure enable new mobile measurement and information for feedback in diverse environments. The focus is on empirical validation of the utility and value of the devices they develop. The work is not only "good fun" but is socially beneficial and can demonstrate devices that have a tangible, real life benefit.

TECHNOLOGY DEVELOPMENT AND EVALUATION

Swing That Thing : Moving to Move draws on these two contexts. Art and design ideation techniques and intuitive development processes are used to generate projects and prototypes that examine different aspects and applications of the aforementioned research concerns and drivers. Prototyping is undertaken using high-level prototyping supports such as the Arduino², as well as plug and play wireless sensor systems such as the Nintendo Wii Remote³ and lower level microcontrollers such as Atmel's AVR⁴. New applications of devices developed by the Advancing Human Performance group at CSIRO are also explored. From these bases custom systems are developed, reflecting the need for wearability and broader aesthetic concerns. Functional evaluation and subjective experience evaluation is undertaken throughout in relation to the research base and intent. This process combines researcher use of the devices, as well as observation, open interview and evaluation of video footage with a range of users. Relevant empirical evaluation techniques are identified, developed and/or implemented accordingly, to assess and evaluate the implications and outcomes of different aspects of the research.

COGNITION AND PERCEPTION

Skill acquisition theory embodies many aspects of the philosophical and psychological enquiry into cognition and perception. By bringing new information to the consciousness of a subject researchers can explore the mental processes of movement. The *Swing That Thing...* research complements the research being undertaken by the CSIRO Advancing Human Performance Theme in this respect as they are resulting in both soft and empirically driven outcomes for a broad range of applications including Fine Art, Entertainment, Sport and Medical applications. The projects and devices being developed are resulting in new means of field-based measurement of movement and the sharing of an individual's experience of movement capability with others. Outcomes are contributing to the philosophical and psychological enquiry in both the Art / Design, and Scientific contexts.

CONCLUDING PROPOSAL

The *Swing That Thing : Moving to Move* project provides a pertinent example of how art and design research techniques and outcomes can inform and morph into empirically-driven research, particularly when undertaken in a science and engineering context. While not elaborated in this position paper, the author proposes to provide relevant examples from both the *Swing That Thing...* and the CSIRO Advancing Human Performance research, to discuss how undertaking Art/Design and Scientific research into sensory augmentation and body memory technology in close proximity can enrich and extend philosophical and psychological enquiry into cognition and perception for a range of contexts.

² <http://www.arduino.cc/>

³ <http://www.nintendo.com/wii/what/controllers>

⁴ <http://www.atmel.com/products/AVR/>