

Archive To Repertoire: Motion Capture & Motion Sensing Data For Digital Intangible Heritage (DIH)

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Abstract - This study investigates the transformation of digital documentation of Kung Fu into an interactive performative space for public engagement. The study creates an interface for learning the repertoire of forms from significant lineages from the south Chinese traditions—contributing to the perpetuation of this art form. The investigation will contribute to the theoretical understandings of the relationships between archive and repertoire, specifically in relation to performance and intangible heritage. The intricate user interaction in this study enforces the visitor's perception that the Kung Fu instructor is present behind the screen, which simulates physical intimacy.

Index Terms - Digital Intangible Heritage, Serious Games, Virtual Reality, Traditional Knowledge

I. INTRODUCTION

The project's philosophical point of departure is grounded in performance theory through orientations such as Carlson's [1] "Consciousness of Doubleness," which posits that the genuine execution of an action lies in the mental compression with the original model of that action. Moreover, the study examines the possibilities to transform archival data to a form of a repertoire for the visitors' performance inside a museum as discussed by Taylor [2]. Taylor argues that recorded information about the performance is another form of performance. Research in performance also explains the notion of intimacy and says that it develops due to the closeness, trust and familiarity [3]. Feelings of intimacy arise because of the physical comfort.

This study is a unique attempt to develop a virtual instructor from the Motion Capture (mocap) data of Kung Fu masters, which will allow users to learn through interactive engagements. The mocap data will represent the Master as a "contoured shadow". This shadowy representation brings the receiver and the transmitter of the heritage content close to each other, as discussed and justified by the research in Shadow Theatre by Kent [4]. Shadows can be regarded as a surrogate for the physical master at the moment of performance. Acknowledging the human-scaled mocap data in the form of a shadowy representation on a human-scaled screen establishes a connection between the data and the visitor through augmented learning based visual feedback on

the screen. The proposed scenario will invite the development of a unique and intimate relationship, helping to establish a "master-disciple" bond.

The rationale for carrying out this study lies in two facts: (1) there is a deficit in the research related to motion-capturing and motion-detecting technologies in DIH; and (2) a lack of relevant research in which a mocap performer interacts with visitors in public spaces to create learning experiences. The use of mocap in DIH and the performing arts is limited and requires further investigation in maintaining the continuity of "production", "survival" and "access" in the realm of digital heritage [5]. The proposed case studies will also fill the gap in the literature by investigating new possibilities where archival data is transformed to repertoire. Hence, the study would benefit both theorists and practitioners in the context of DIH by stimulating the intellectual encounters and cultural interchanges. Additionally, it will contribute to the UNESCO's stated ambition of safeguarding the cultural diversity and creativity of humanity through "the process of collective recreation" and "formal or non-formal education" [6].

II. SCENARIO

The proposed prototype application uses archival data from the Hong Kong Martial Arts Living Archive. Visitors first calibrate with the avatar and then look at the six basic steps on top of the transparent rear projection screen as shown in fig. 1.

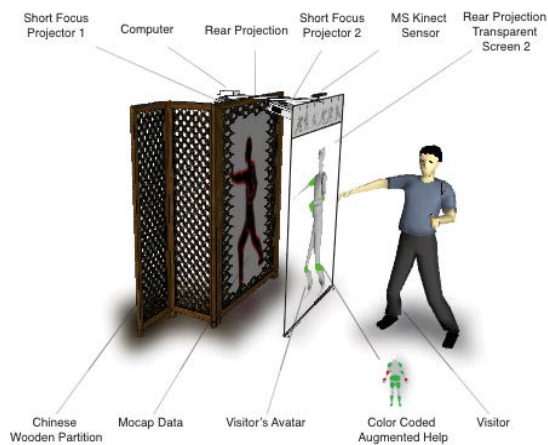


Fig. 1. Proposed museum installation for learning the six basic Kung Fu martial art steps.

REFERENCES

- [1] Carlson, M. (2013). *Performance: A Critical Introduction* (p. 288). Routledge.
- [2] Taylor, D. (2003). *The archive and the repertoire: Performing cultural memory in the Americas*. Duke University Press.
- [3] Chatzichristodoulou, M., & Zerihan, R. (2012). A Discussion on the Subject of Intimacy in Performance, and an Afterword. *Intimacy across Visceral and Digital Performance*. Retrieved from http://scholar.google.com.au/scholar?hl=en&q=A+discussion+on+the+subject+of+intimacy+in+performance%2C+and+an+afterword&btnG=&as_sdt=1%2C5&as_sctp=#0
- [4] Kent, L. (2005). *Breaking the Fifth Wall: Enquiry Into Contemporary Shadow Theatre*. Retrieved from <http://eprints.qut.edu.au/16147/>
- [5] Webb, C., & Australia, C. N. L. of. (2003). *Guidelines for the preservation of digital heritage*. Retrieved from http://infolac2.ucol.mx/mow/direcpatdig/directrices_patrimonio_digital_ingles_version.doc.
- [6] Hennessy, K. (2012). Cultural Heritage on the Web: Applied Digital Visual Anthropology and Local Cultural Property Rights Discourse. *International Journal of Cultural Property*, 19(03), 345–369. doi:10.1017/S0940739112000288

This transparent screen is placed in front of the Chinese wooden partition. One of the sections of the wooden partition represents the shadowy mocap data from the master. The data is monochromatic and shadowy with some three dimensional details. Visitor or visitor's avatar tries to match or overlap the shadowy representation from the master on the foreground transparent screen. The visitors, one after another, try to mimic each shadowy body positions and complete the six steps. Since shadowy data is a mocap data, the rotational and translational parameters can be matched with the visitor's avatar through the conditional statements within the unity-scripting environment. Color-coded augmented learning cues help the visitor to match with the shadowy mocap data. A reward is offered to the visitor if all the steps are completed within a specific time. This is a unique technology based intervention where Kung Fu motion captured archival data will transform into a working prototype as a repertoire. Based on various feedback and other limitations, it is intended that the prototype will be adjusted and modified during the fabrication period.

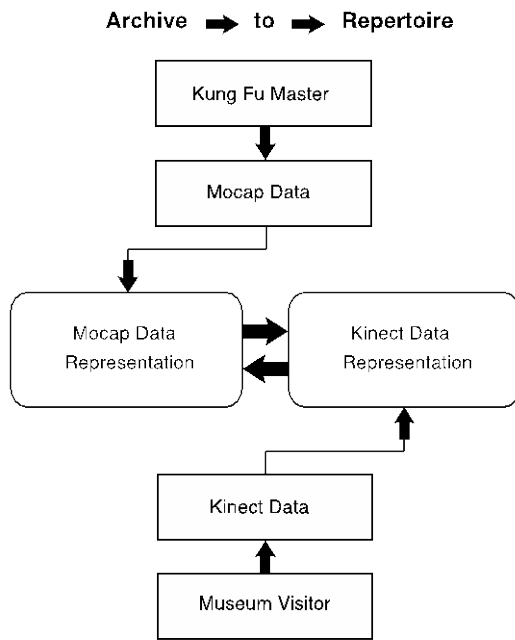


Fig. 2. Schematic diagram showing the transformation of archival data to a repertoire for the learning of Intangible Cultural Heritage (ICH).

III. EVALUATION

The study proposes three practitioner-based case studies in distinct geographical regions: Hong Kong, the People's Republic of China and Dubai, United Arab Emirates. The research will undertake extensive evaluation of the application through triangulated data gathering tools such as direct/indirect observation, questionnaire, and interviews to discuss the visitors' responsiveness.