# *Yokai in the Machine*: reconsidering a gesture of 3D scanning in modelling formative qualities of artwork for the visually impaired

In Japanese mythology, yokai are entities that have no substance in this world in three dimensions. As yokai transcend sensory perception, many artists have sought to capture them with form and color. While yokai cannot be seen in real terms, artists render them in two or three dimensions using a four-dimensional gesture based on the image in the mind. The same might be said of 3D models, that is, models produced by means of scanning or photogrammetry. Such models exist in a virtual dimension before being printed in a range of materials including plastic, concrete, and metal. This paper draws from research that explores the role of 'touch' in the socio-cultural shaping of yokai. Working in collaboration with Japan's National Museum of Ethnology, the research investigates the combination of 3D printing and traditional materials and techniques for improving museum accessibility for the visually impaired. The aim of this paper, however, is to problematize the gesture of the 3D scanning technologies as photomediation.

The concept behind 3D scanning dates back to ancient Roman sculptors, who revered Greek art and made many copies (Roman copies) of Greek sculptures. They used a technique similar to the Pointing method, which involves plotting the coordinates of an object's surface in space and carving the material based on these points. That the technique relied on touching is relevant today. There are currently two types of 3D scanners: a contact-type, whereby a probe touches the surface, and coordinate information is compiled into 3D data; and a non-contact-type, whereby light is used to gather information based on reflection and surface irregularities. Both types resemble tracing a form with hands or fingers. Somehow, a sense of 'touching and seeing' remains present in this measurement.

Non-contact 3D scanning is on the verge of becoming ubiquitous in the sense that it may disappear as more uses are found (Weiser 1991). While 3D printing technology has become more accessible, scanning technologies (e.g. LiDAR and photogrammetry) have begun to appear in consumer devices, further complicating photography as a process whereby cameras are tools for seeing and engaging as well as recording (see Lehmuskallio and Gómez Cruz 2016). Even if accepting that photography is expansive and inseparable from discourse around ubiquitous computing (Kember 2012), it is still important to recognize that users of today's non-touch-scanning-enabled devices are perhaps less alert to that view than thought. If other forms of photomedia are important for enriching experiences with digital cameras (McLeod 2023) — use of analog forms being often niche and access to them privileged — the same might be argued for 3D scanning. Should one 'touch' a subject without more experience of touching?

Taking up Flusser's call to reflect upon gestures from that of an observer, what is seen when scanning? Of the photographic gesture, Flusser (2014) described a procedure of looking, doubting, and deciding how a subject be described. Moreover, the gesture of filming for Flusser was understood as a long strip of photographs whereby the camera "travels" and imagination "shapes" events to tell stories. If the filmic gesture presented a subject, a gesture of video represented both the subject and itself; it extended both gestures to enable a conversation with the medium. This video gesture proposed new categories of thinking that weren't at that time clear to analyze, but Flusser did write that it was necessary "to think in video, in analog and digital models and programs, in multidimensional codes" (2014: 25). Curiously, a sculptor's gesture is mentioned in relation to the video gesture in that sculpture depicts but video plays back. This suggests video 'belongs to a different reality from sculpture' (Ibid: 143), but Flusser may have meant sculpture made by a 'Western' sculptor (one that tries to work only with new materials and tools). His description of carving an African mask was tellingly different from Western sculptures because the gesture expressed one's own specific character within a framework of given materials, tools, and patterns. Noting how others relate the performative nature of such carving to practices of channeling magic, Flusser reasoned that any magic present was merely one of many possible results rather than a cause. The same can be said of the 'black boxes' of non-touch-scanning-enabled devices.

As sculptor and photographer, the authors posit the gesture of scanning as inherently a gesture of examination and doubt. By scanning an object, we now arguably 'touch' every available part. Accurate scans

being such that a camera's lens has been suitably directed at the surface of the object from every conceivable angle. Yet, as with yokai, what results from such a gesture is still simultaneously mobile and elusive. Learning from such an anomaly entails reconsidering how touch 'works in synchrony with vision and offers a support for optical institutionism" (Elo, 2018: 56). Although touch guarantees sensory certainty, it does so by confirming what is seen. We ask what if nothing is seen, in the privileged sense of seeing? As Elo reminds, "touching involves a gap; it goes across a distance without any guarantee of a securing return" (Ibid: 41). A light touch therefore becomes most apt for a gesture of scanning, but it also still feels impoverished compared to those for whom touch is a primary interface for experiencing the world. In hoping for a literacy of touch, we argue that those with visual impairments have much to teach the 'visually paired'.

**References:**

Weiser, M. (1991). 'The computer for the 21st century', http://www.ubiq.com/hypertext/weiser/ SciAmDraft3.html. Accessed 19 December 2023.

Elo, M. (2018). 'Light Touches: a Media Aesthetic Mapping of Touch', M. Elo & M. Luoto (eds) *Figures of Touch: Sense, Technics, Body.* Helsinki: The Academy of Fine Arts at the University of the Arts Helsinki, pp. 34–41.

Flusser, V. (2014). *Gestures*. Minnesota: University of Minnesota Press.

McLeod, G. (02 Nov 2023). 'Slow glass: a case for photomedia literacy', *Journal of Visual Literacy*, DOI: 10.1080/1051144X.2023.2277029

Kember, S. (2012). 'Ubiquitous photography', *Philosophy of Photography* 3:2, pp. 331–348, DOI: 10.1386/pop.3.2.331_1

Lehmuskallio, A. & Gómez Cruz, E. (2016). 'Why material visual practices?', E. Gómez Cruz & A. Lehmuskallio (eds) *Digital photography and everyday life: Empirical studies on material visual practices*. London and New York: Routledge, pp. 1–16.