SENSUAL EMBODIMENT: WHEN MORPHOLOGICAL COMPUTATION SHAPES DOMESTIC OBJECTS

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IM BLANKY (Figure 1) and CURTAIN (Figure 2) are technologically augmented textile prototypes conceived within the context of the domestic environment. Ubiquitous computing presents physical objects, artifacts in the real world with the possibility of gaining agent characteristics, or autonomy. An agent is defined as any object—any physical body/bodies or thing regardless of its abstract categorization, that is, human, animal, vegetal, robot or artifact—that has the ability to sense and act on its environment (Pfeifer 2007).

Object-agents in that sense are seen as variations of physical robots. This augmented condition shares some critical overlaps with AI’s preoccupation with the concept of embodiment which views the body of an agent, in this case an artifact – in its interaction with the world – as the primary shaper of intelligence. In other words the brain is not the only computational system, computation is manifested in or distributed into the morphology and materiality of the body.

The aim is to expand on object intelligence. Technology is not simply embedded in an object. The object, through its calibrated morphology and materiality, becomes the sensual embodiment of the technology.
IM BLANKY

A blanket with an IP address, the basic v. 1.0 is self-modeling. It is wirelessly linked to a digital model which registers and reprocesses its changing state in real time.

Exploiting the blanket’s niche or task environment, the blanket’s surface is sensitized through a matrix of soft tilt sensors. The blanket relies on the movement of the body along with gravity for sensory stimulation, turning movement directly into usable information. The blanket’s ornamental expression—a product of the logic of energy flows—arouses empathy vis-à-vis the subject, inviting more frequent usage, thereby generating more data. Through morphological, that is, embodied (versus embedded) computation, Blanky’s body is the information processing system.

With potential healthcare applications, next generation BLANKY will focus on sensing additional biometric data such as breathing. The blanket can be seen to function within an ecology of domestic objects all capturing partial vital signs, forming over time a dynamic evolving profile of the inhabitant.

CURTAIN

The project is a prototype for an actuated textile. The membrane’s need to respond to contradictory forces such as privacy versus light, or view versus insulation, resulted in a textile that can open and close locally without the aid of an external or hard mechanical infrastructure (Figure 3 bottom). As a quintessential domestic technique, crochet is harnessed for its capacity to model mathematically complex topological surfaces (Taimina 2009). Proximity sensors are distributed within the textile, triggering a cluster of modules to close upon sensing a viewer. Caressing the surface with one’s hand expands the zone of privacy.

The module’s form evolved directly from trial and error experimentation with SMA behavior. The crenellation—the result of an exponential increase in stitches with each concentric row—allows the module to close and open without deforming the entire surface. The edge’s expanded surface accommodates a longer SMA wire, increasing actuation, while a pulsating current minimizes energy use.

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WORKS CITED


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IM BLANKY—“Flower” tilt sensor.1 The Resistance value from each petal determines the local tilt direction

Bottom CURTAIN—behavior study diagrams

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