

TENDRILS: SENSING & SHARING TOUCH

Thecla Schiphorst & Hwaryoung Jinsil Seo

INTRODUCTION

tendrils is a responsive kinetic wearable art-work in the form of an interactive garment that responds to shared active touch, both locally on the garment and collectively through remote networked wearable armbands that are a part of the *tendrils* network.

The design focus is the exploration of physical sensory experience mobilized through the embodied participation of active touch (Gibson, 1962). *tendrils* explores the poetic and somatic design constructs of *somaesthetics* (Shusterman, 2008) through material explorations using soft-circuits and networked mobile computing. *tendrils* highlights design for the sensory experience of the self (Alexander, 1932) incorporating the themes of experience, poetics, materiality, and semantics of interaction as design strategies in our concept of somaesthetics of design (Schiphorst, 2009).



Figure 1. *tendrils* uses active touch through hand-sewn sensors

DESIGN CONCEPT



Figure 2: kinetic interaction responds to collective touch

tendrils is constructed from vibrant raw silks, soft-circuits, hand crafted tactile stroke-sensors, LEDs and motors that responds to collective touch, locally on the garment surface, and through a remote mobile phone Touch App served through a networked link. The *tendrils* garment is constructed from iterative explorations of soft circuits using conductive fabric, yarn and thread that incorporate the Arduino lilypad (Buechley et al, 2008). A conceptual focus is exploring the integration of *somaesthetics* in our design process (Shusterman, 2008; Schiphorst, 2009). Somaesthetics is a concept coined by Richard Shusterman, a pragmatist philosopher interested in the critical study of bodily experience as a focus of sensory-aesthetic appreciation and agency. Bodily experience can be considered as a technical skill, and *tendrils* explores how tactile interaction can elicit sensory capabilities in order to increase technical facets of attention that support sensory-aesthetic experience and communication.

tendrils is a metaphor for the connective tissue, invisible particles, filaments and networks that combine to create our collective selves, the interstitial signals that flow within our bodies, enacting Merleau-Ponty's notion of the "flesh of the world" (Merleau-Ponty, 1964) .

Like a tidal-pool *tendrils* reflects movement and visual patterns as an eco-system of tiny sensory-motor responses, in which we touch 'something of the self' within an elemental architecture. The *tendrils* garment is reminiscent of an active and intelligent skin that poetically responds by shivering, quivering, sighing, and 'alighting'.

These skin-like responses are actuated materially by a series of small, interconnected motors and lights that reflect the inner energy and nervous system of the garment. Based on biological cellular structures that alter their structural form as a response to touch, *tendrils'* subtle movements reflect its ecological connection to our larger movements as a whole.



Figure 3. *tendrils* stroke-sensor is hand-sewn using conductive silk organza and a row of resistors to enable positional tactile data to be sensed directly on the garment and actuated through the petals and motors

REFERENCES

- Alexander, F.M. 1932. *The Use of the Self*. New York: E.P. Dutton.
- Bartenieff, Irmgard, & Lewis, D. 1980. *Body Movement, Coping with the Environment*. New York: Gordon and Breach Science Publishers.
- Buechley, Leah, Mike Eisenberg, Jaime Catchen, and Ali Crockett. 2008. The LilyPad Arduino: using computational textiles to investigate engagement, aesthetics, and diversity in computer science education. In *Proceeding of the SIGCHI conference on Human factors in computing systems (CHI)*, 423-432. Florence, Italy: ACM.
- Gibson, James, Jerome. (1962). Observations on active touch, *Psychological Review*, 69(6), 477- 491.
- Merleau-Ponty, Maurice. 1964. *The Primacy of Perception*. Northwestern University Press.
- Schiphorst, T. 2009. Soft(n): Towards a Somaesthetics of Tactile Interaction. In *Proceeding of the SIGCHI conference on Human factors in computing systems (CHI)*. 2427-2438. Boston, MA :ACM.
- Shusterman, R. 2008. *Body Consciousness: A Philosophy of Mindfulness and Somaesthetics*. Cambridge University Press, Cambridge, MA.



Figure 4: soft-circuit armband design incorporating conductive yarn, LEDs, vibration and arduino lilypad and xbee

ACKNOWLEDGEMENTS

tendrils was premiered during the Vancouver Cultural Olympiad in February 2010, in the CODE LIVE international exhibition (*tendrils* 1.0), was exhibited at ACM Multimedia 2010 Interactive Art Exhibition in Firenze Italy at

the at the Palazzo Medici-Riccardi from 25 October through 6 November, 2010, and was selected for Art Explorations at TEI 2011 in Funchal Madeira, Portugal, January 23-26 2011. Thanks to the *tendrils* design mentors Norm Jaffe and Sang Mah and SFU SIAT students: (tendrils 1.0) Meta Vaughan, Michael Chang, Lisa Guo, Kyle Jung, “Matt” Karakilic, Kyle Sakai, Moein Sabouhiyan, and (tendrils 2.0) Jack Chen, Mark (Lu) Cheng, Stephanie Guzman, Maxine Kim, Justin Sy, Gareth (CJ) Wee.