

## **HUG**

KOSKI, Kaisu

Available from Sheffield Hallam University Research Archive (SHURA) at:

<https://shura.shu.ac.uk/28767/>

---

This document is the Accepted Version [AM]

### **Citation:**

KOSKI, Kaisu (2021). HUG. In: C&C '21: Creativity and Cognition. ACM. [Book Section]

---

### **Copyright and re-use policy**

See <http://shura.shu.ac.uk/information.html>

# HUG

Kaisu Koski

Sheffield Hallam University, k.koski@shu.ac.uk

HUG is a pneumatic garment that creates a sensation of a hug without the proximity of another person. It is inspired by “hugging” garments, used in so-called deep-pressure therapy, imitating the structure of embodied human empathy.

**CCS CONCEPTS** • Applied computing--Arts and humanities--Media arts

**Additional Keywords and Phrases:** Hug, garment, pneumatics, breath, anxiety, isolation, recycled materials.

**ACM Reference Format:**

Kaisu Koski. 2021. HUG: In ACM Conference on Creativity & Cognition '21, June 22–23, 2021, ACM, New York, NY, USA.

## 1 Introduction



Pressure garments are used to calm anxiety in human and nonhuman animals [1] and to create a variety of sensory XR experiences in correspondence with visual media [2]. HUG is a low-tech pneumatic garment that creates a sensation of a hug without the proximity of another person or other external stimuli. It is the first prototype in a project exploring artificial empathy, to be used independently by blowing air into two tubes. It has two air pockets, one on the chest and one between the shoulder plates. These can be filled with air separately or simultaneously to simulate a hug. HUG is inspired by “hugging” garments, used in so-called deep-pressure therapy, imitating the structure of embodied human empathy. Regarding its focus on the experience of a hug, the

prototype connects to studies with interactive hug simulating garments [3]. However, instead of requiring the person to hug a mannequin to activate the garment, or other external media input, HUG's symbiotic self-hugging nature derives from the person's flow of breath. HUG builds on the author's clinical empathy education research, exploring the capacity haptic interfaces have to comfort in mental–physiological distress.

Next to offering relief from isolation and lack of affective touch, the piece evokes questions about breath and its multiple meanings in connection with others and mental well-being. In pandemic times, breath is seen as a biohazard, a cloud of pathogenic aerosols that needs to be contained. On the other hand, holding a breath or breathing into a paper bag may also reduce anxiety [4,5] though the method is not without risks [6]. In HUG, breath thus creates a feedback loop to calm both through deep pressure and carbon dioxide reduction in the bloodstream. The prototype utilizes recycled materials from lockdown online order packaging.



## REFERENCES

- <bib id="bib1"><number>[1]</number> Duvall, JD., Dunne, LE., Schleif, N. and Holschuh, B. (2016). Active "hugging" vest for deep touch pressure therapy. Proceedings of the 2016 ACM International Joint Conference on Pervasive and Ubiquitous Computing: Adjunct (UbiComp '16). Association for Computing Machinery, New York, NY, USA, 458–463. <https://doi.org/10.1145/2968219.2971344>.</bib>
- <bib id="bib2"><number>[2]</number> Delazio, A., Nakagaki, K., Klatzky, RL., Hudson, SE., Lehman, JF., and Sample, AP. (2018). Force Jacket: Pneumatically-Actuated Jacket for Embodied Haptic Experiences. Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems (CHI '18). Association for Computing Machinery, New York, NY, USA, Paper 320, 1–12. <https://doi.org/10.1145/3173574.3173894>.</bib>
- <bib id="bib3"><number>[3]</number> N. Takahashi, R. Okazaki, H. Okabe, H. Yoshikawa, K. Aou, S. Yamakawa, M. Yokoyama, H. Kajimoto. (2011). Sense-Roid: Emotional Haptic Communication with Yourself. Proceedings of the Virtual Reality International Conference 2011, France. Available at: <https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.720.3592&rep=rep1&type=pdf>. Retrieved: April 22, 2021.</bib>
- <bib id="bib4"><number>[4]</number> McNally, R. J., & Eke, M. (1996). Anxiety sensitivity, suffocation fear, and breath-holding duration as predictors of response to carbon dioxide challenge. *Journal of Abnormal Psychology*, 105(1), 146–149. <https://doi.org/10.1037/0021-843X.105.1.146>.</bib>
- <bib id="bib5"><number>[5]</number> Papp, L. A., Klein, D. F., & Gorman, J. M. (1993). Carbon dioxide hypersensitivity, hyperventilation, and panic disorder. *The American Journal of Psychiatry*, 150(8), 1149–1157. <https://doi.org/10.1176/ajp.150.8.1149>.</bib>
- <bib id="bib6"><number>[6]</number> Callahan, M. (1989). Hypoxic hazards of traditional paper bag rebreathing in hyperventilating patients. *Annals of Emergency Medicine*, 18(6), 622–628. [https://doi.org/10.1016/S0196-0644\(89\)80515-3](https://doi.org/10.1016/S0196-0644(89)80515-3).</bib>