

Interactive Textiles

HAID 2022 Workshop

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Workshop Overview

- Introduction to textiles and e-textiles
- Exploring the materials “pet zoo”
- Building a haptic, textile sensor
- Connecting the sensor to Bela
- Wrap up and discussion



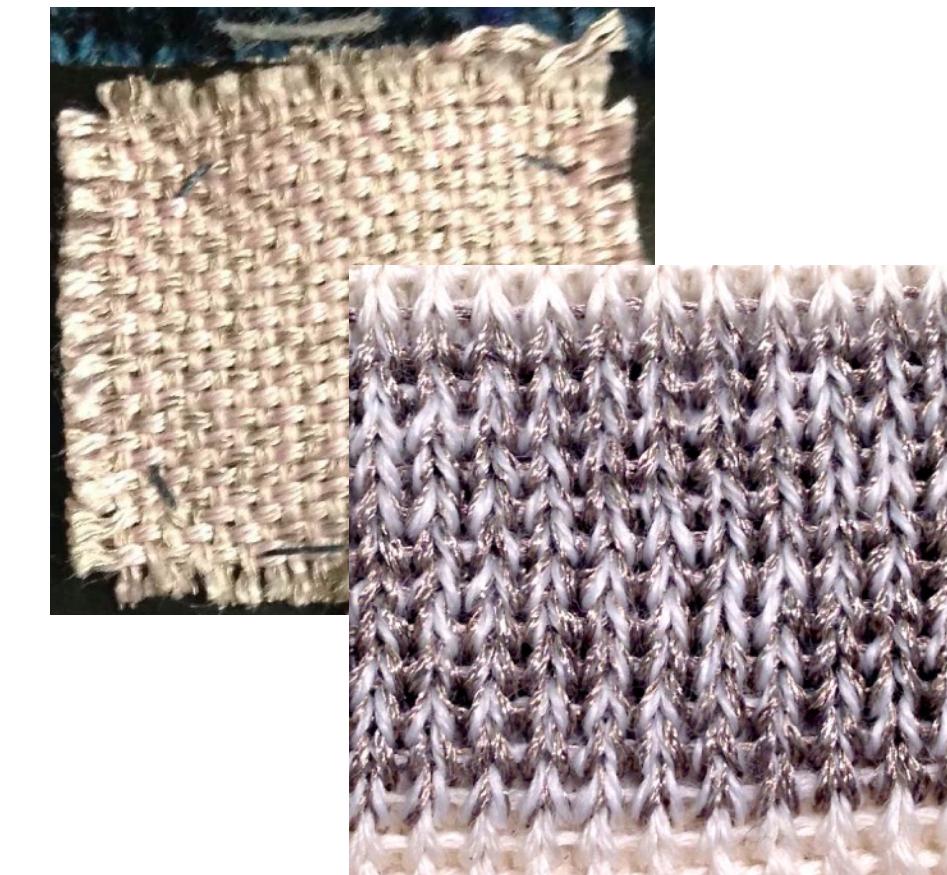
Textile Materials

Overview

- non-conductive materials:
 - cotton, wool, linen, silk, ...
 - nylon, polyester, acrylic, ...
- conductive materials:
 - copper, silver, steel, iron, ...
 - carbon, graphene, ...

Textile Structures

Overview



fibre / filament

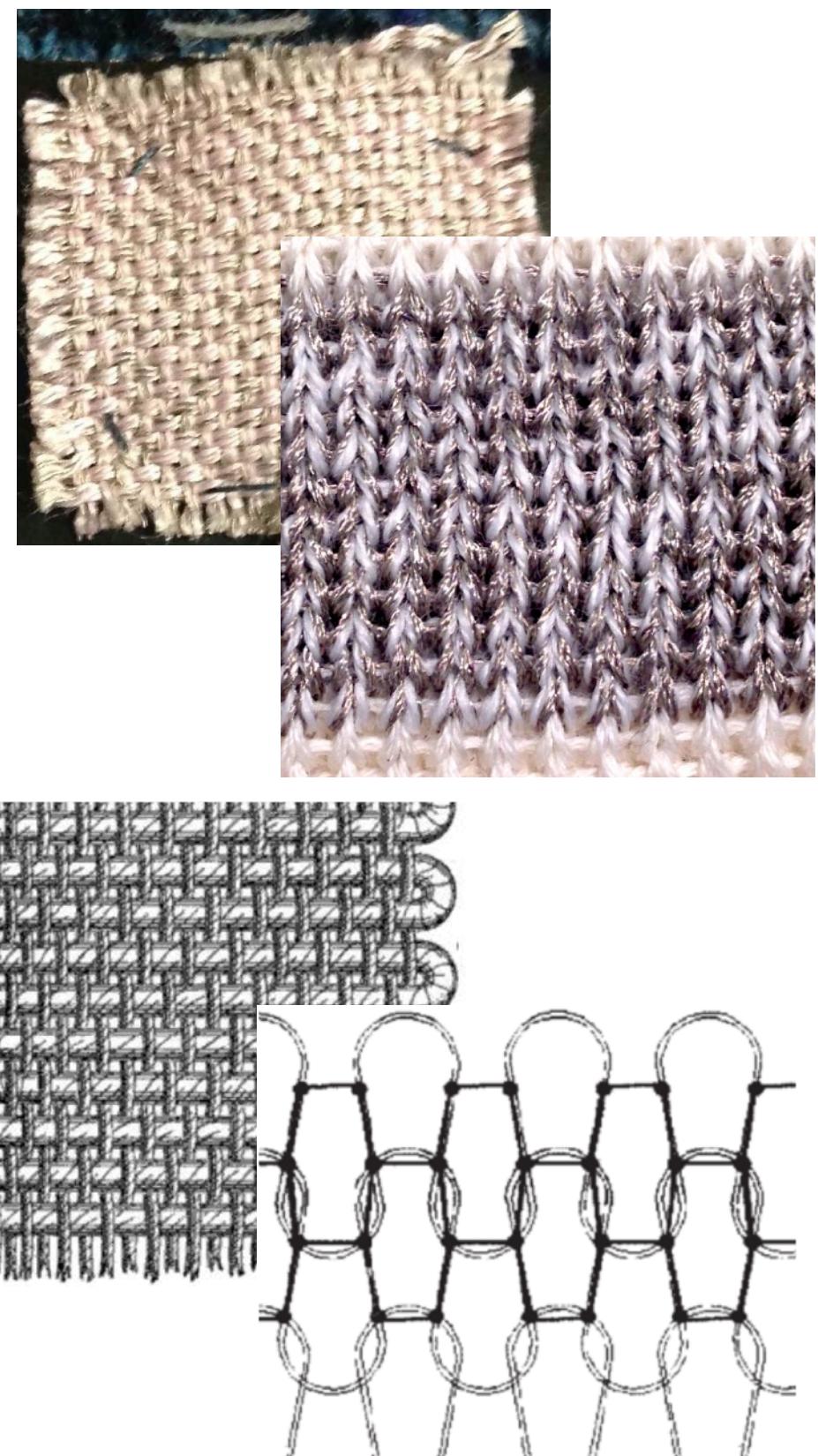
yarn / thread

fabric / textile surface

Textile Structures

Overview

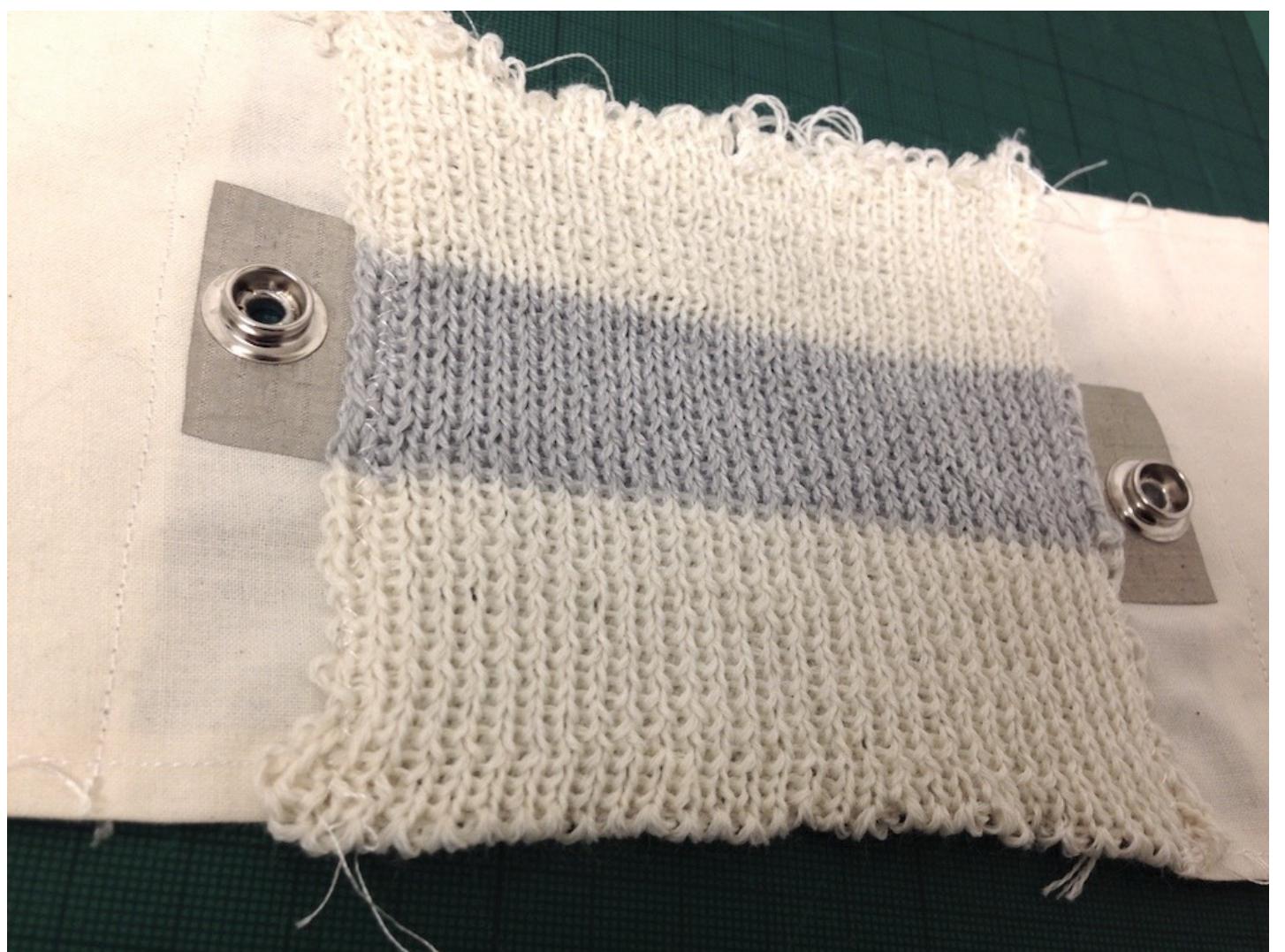
- weaving
- knitting
- felting
- braiding
- crocheting
- embroidery
- ...



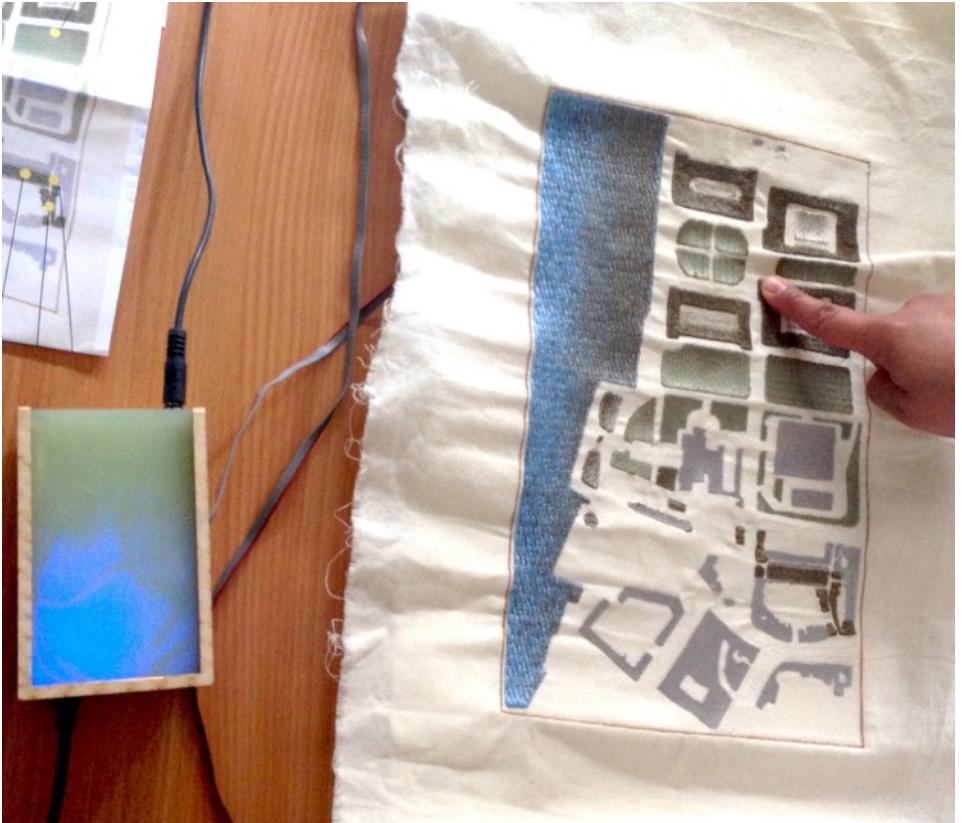
Textile Sensors

Examples

- Switches
- Capacitive sensors
- Piezo resistive sensors (pressure, stretch)
- Piezo electric sensors
- Textile speakers
- Antennas



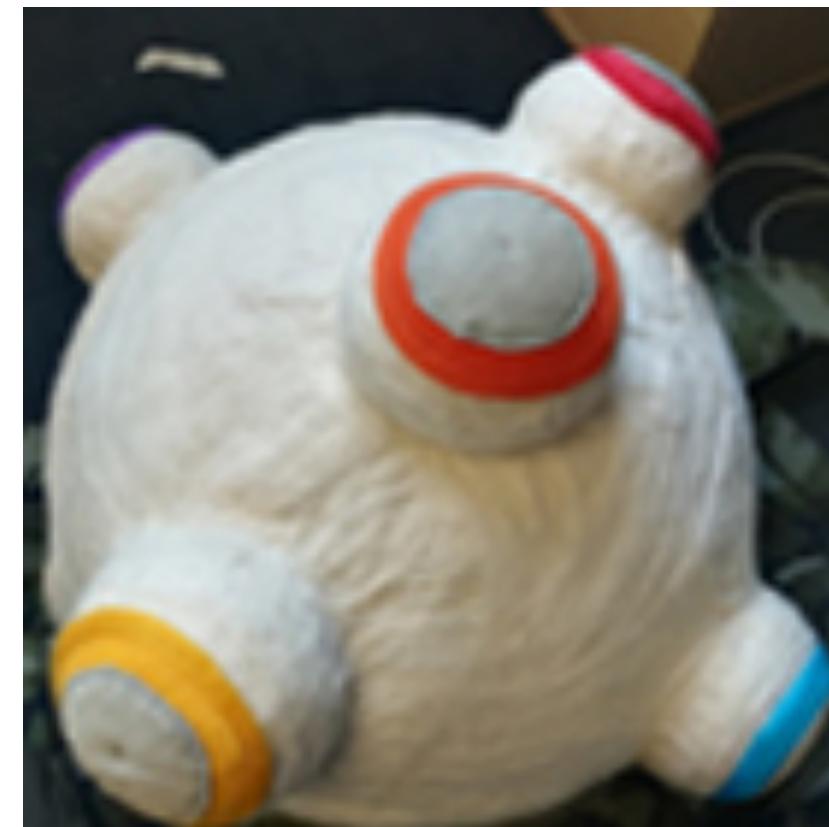
Applications Examples



Aural Fabric (Alessia Milo)



Knitted Keyboard
(Irmandy Wicaksono)



Mazi, collaborative sound interface
(Antonella Nonnis)



MiMu Gloves
(Adam Stark, Rachel Freire, et al)



Sonic Quilts (Liza Stark)

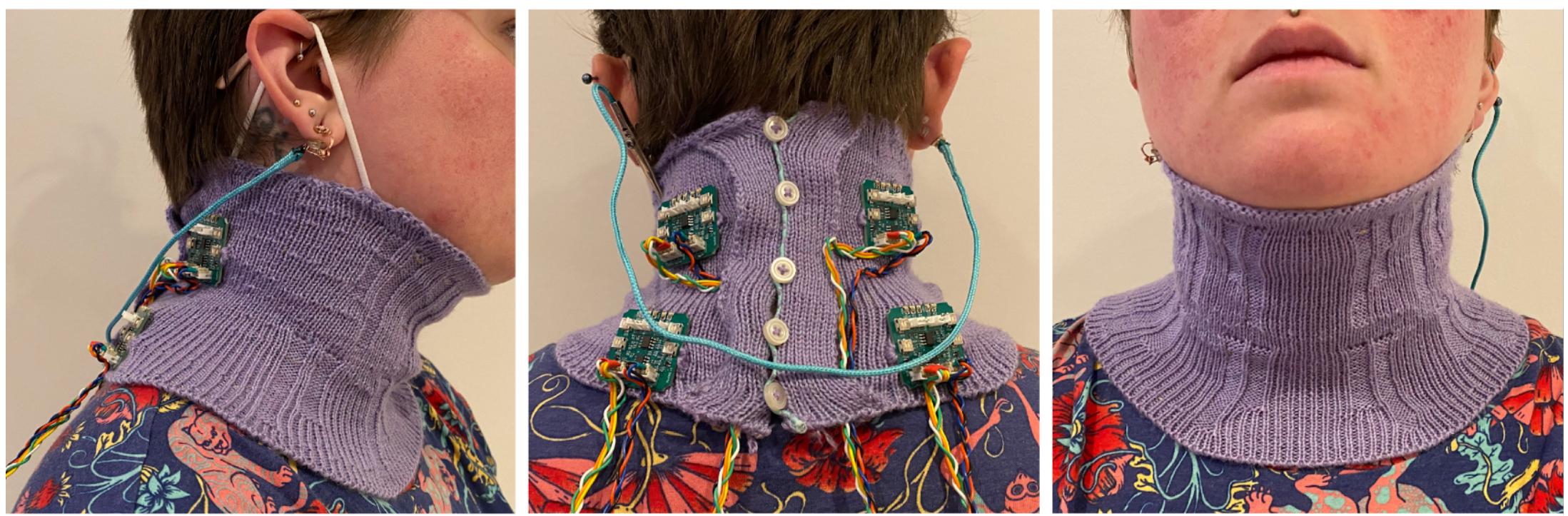


Project Jacquard
(Google x Levi's)



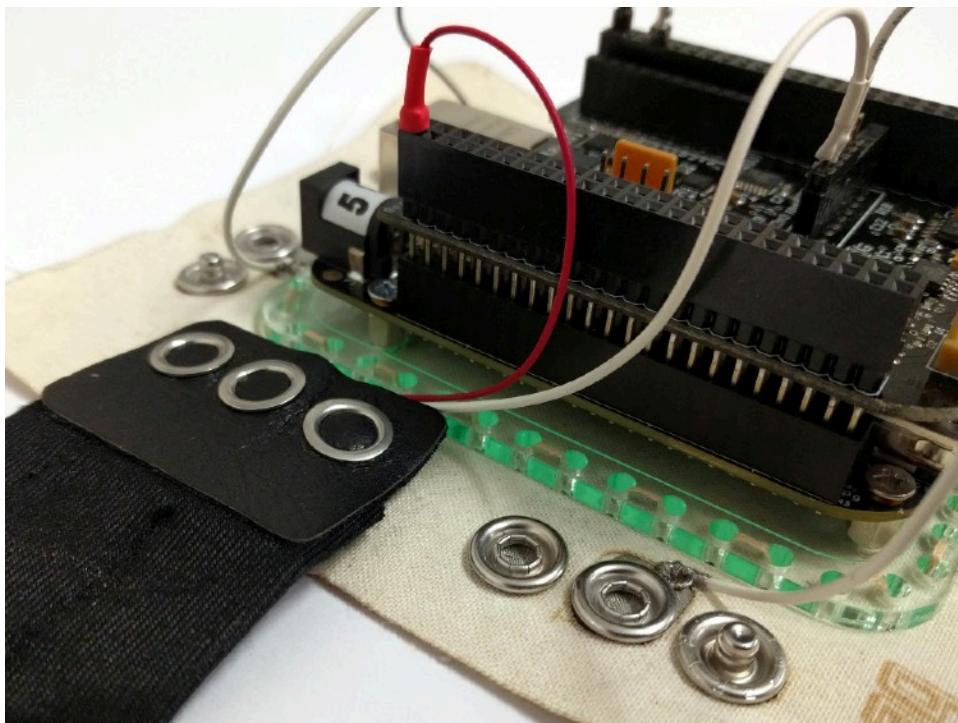
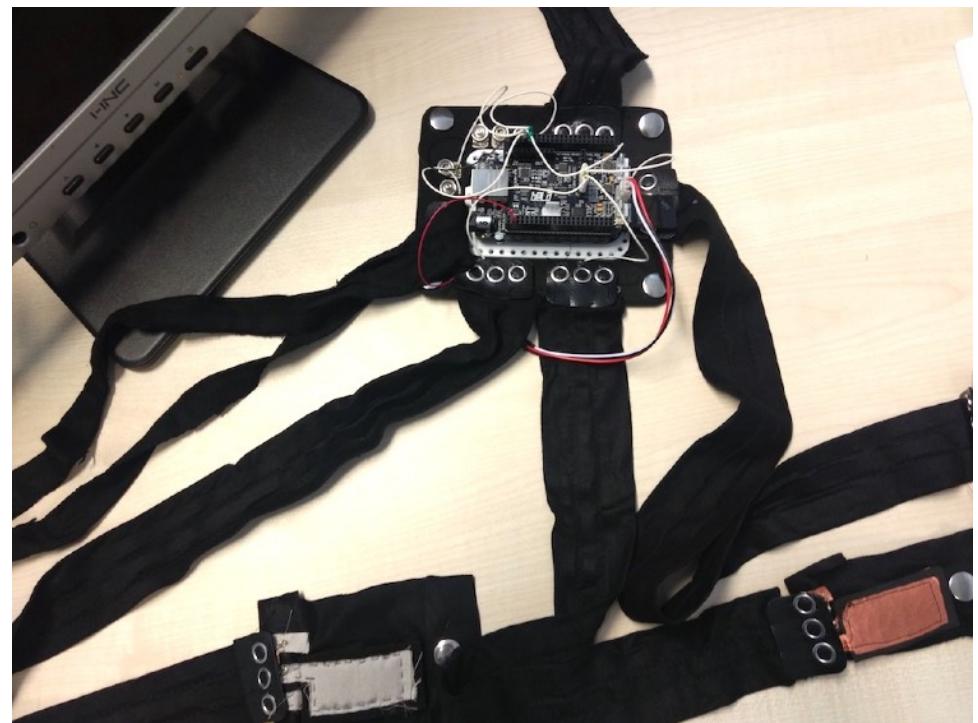
Knitted Radio
(Irene Posch)

Applications Examples

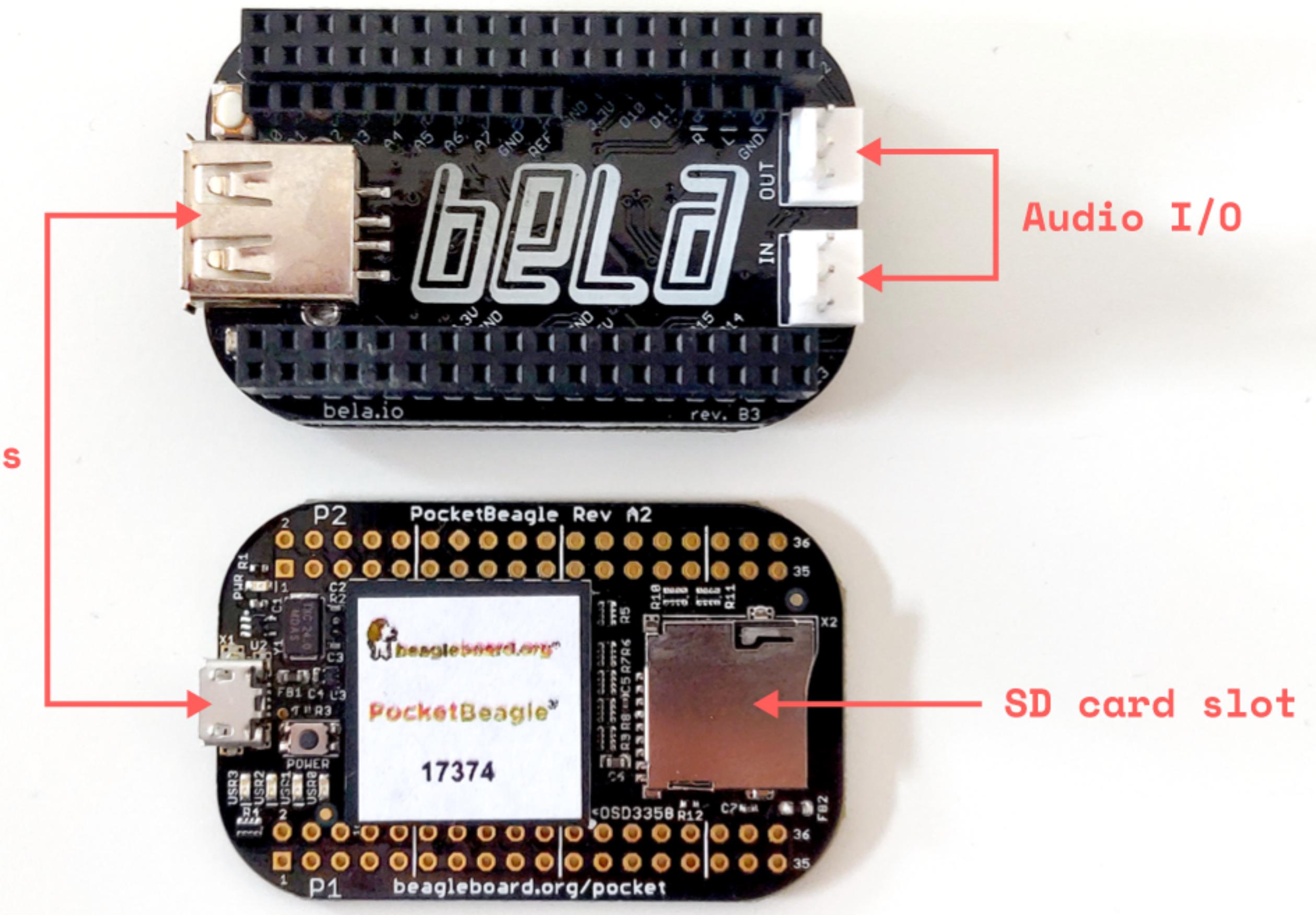


Bela

<https://bela.io/>



USB ports



Bela

<https://bela.io/>

**discount code: HAID2022
get 10£ or 15€ off starter kits**

Related Works

conference, journal papers, books

- Mlakar, S., Alida Haberfellner, M., Jetter, H. C., & Haller, M. (2021). Exploring affordances of surface gestures on textile user interfaces. In *Designing Interactive Systems Conference 2021*.
- Stewart, R. (2019). Cords and chords: Exploring the role of E-textiles in computational audio. *Frontiers in ICT*, 6, 2.
- Gonçalves, C., Ferreira da Silva, A., Gomes, J., & Simoes, R. (2018). Wearable e-textile technologies: A review on sensors, actuators and control elements. *Inventions*, 3(1), 14.
- Kettley, S. (2016). *Designing with smart textiles* (Vol. 56). Bloomsbury Publishing.
- Heinzel, T. (2014). Haptic and Sound Correlations in Textiles. In *Proceedings of Ambience'14 Conference*.
- Castano, L. M., & Flatau, A. B. (2014). Smart fabric sensors and e-textile technologies: a review. *Smart Materials and structures*, 23(5).
- ...

Related Works

websites and other resources

- KOBAKANT. Hannah Perner Wilson and Mika Satomi. <https://www.kobakant.at/DIY/>
- E-Textile Summercamp Swatch Exchange: <https://etextile-summercamp.org/swatch-exchange/>
- Data Paulette: <https://datapaulette.org/>
- Bela Blog: <https://blog.bela.io/e-textiles-and-embodied-interaction-with-bela/>
- ...