HAPLÓS: STRUCTURED VIBROTACTILE STIMULATION FOR EMBODIED LEARNING

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SPEAKING BODIES CONFERENCE



Computing science + Contemporary dance / theater

COGNOVO

HOME ABOUT+ PROJECTS+ PEOPLE+ NEWS EVENTS CONTACT

#1

VALUE JUDGMENTS AND CREATIVE THINKING

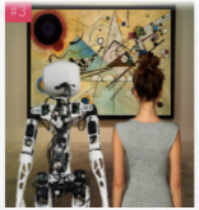
Investigate the role of value based decision making in creative cognition. (more)

#2

CREATIVITY IN DECEPTIVE COMMUNICATION

Compare the roles of creativity and visual imagery in honest and deceptive communication, using behavioural and cognitive neuroscience methods and paradigms. (more)

#3



MODELLING CREATIVE DECISION MAKING

Investigate aesthetic pleasantness in the visual domain, in an inter-disciplinary manner. (more)

#4

NEURALLY INSPIRED ALGORITHMS OF HUMAN COGNITION AND PROBLEM SOLVING

Explore the neurophysiological basis of generative creative processes, using realistic neural models of cortical function and

#5

INDIVIDUAL DIFFERENCES IN VISUAL AND AUDITORY BISTABILITY

Investigate the relationships between switching rates in multistable perception, executive functions, creativity and personality in adults and children, and determine the

#6

CREATIVITY THROUGH SOCIAL INTERACTION

Investigate how creative products emerge through interactions in collaborative teams, and how inter-individual and social abilities influence social creativity in adults and

#7

SHARED CREATIVITY IN DANCE

Exploring the roles of flow experience and metacognitive strategies: imagery and sense awareness in group creativity in dance improvisation. (more)

#8

BODYSHAPING THE MIND

Designing technologies and aesthetic experiences to support embodied cognition. (more)

#9

DESIGNING PLAYFUL SYSTEMS IN MIXED REALITY

Investigate the nature of play in a practice-based manner by designing and developing playful systems in mixed reality. (more)

#10

EARLY CINEMA AND COGNITIVE CREATIVITY

Investigate the cognitive impact of analogue and digital cinematic film projection technologies. (more)

#11

DEVELOPING CREATIVITY IN COGNITIVE ROBOTS

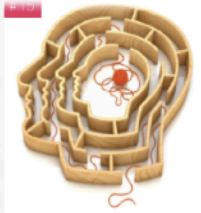
I aim to build robots capable of insight using Hierarchical Reinforcement Learning. (more)

#12

SIGNS OF ALARM FATIGUE

Investigates the cognitive-behavioural correlates of the subjective experience of 'alarm fatigue'. (more)

#16



PREDICTING CREATIVITY FROM SPATIAL ABILITY & PERSONALITY

Investigate the neurobiological basis for creativity, exploring how biological tendencies or temperament may shape the creative personality. (more)

#17

UNCONSCIOUS CREATIVITY: THE EUREKA MOMENT

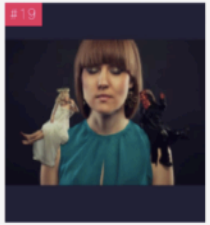
Investigate the 'Eureka' moment, using experimental observations of unconscious problem solving in architectual design (more)

#18

THE ROLE OF COUNTERFACTUAL THINKING IN DECEPTION

Investigate how people use alternatives to reality in order to deceive whilst also examining the mechanisms that underlie this

#19



MORAL COGNITION: AN INTERDISCIPLINARY INVESTIGATION OF JUDGEMENT VERSUS ACTION

Investigating the role of personality traits and arousal factors on moral decision making and the moral action and judgement disparity.

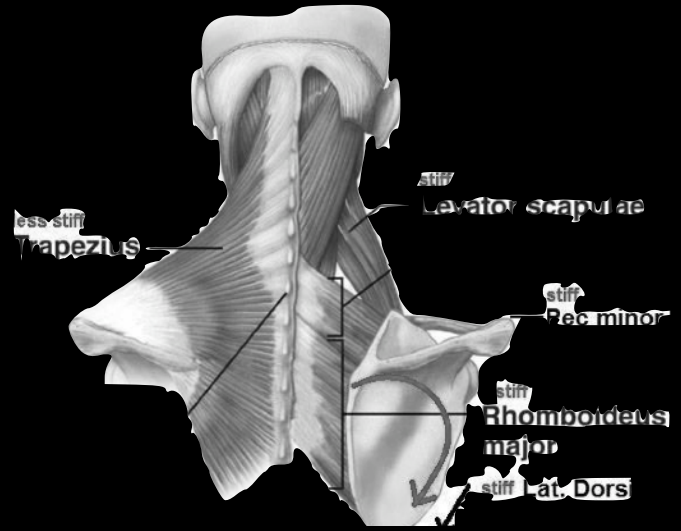
#20

ATTENTION, ASSOCIATIVE LEARNING AND CREATIVITY

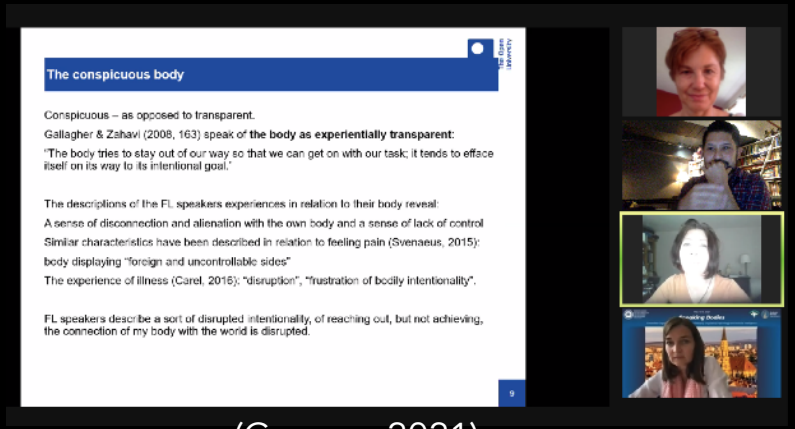
Exploring learning about non-informative cues and how this relates to measures of creative thinking. (more)

COGNOVO

MARIE CURIE ACTIONS



- DIFFERENTIATING BETWEEN AREAS OF THE SHOULDER, NECK, AND CHEST
- FINDING MOVEMENT IN THE SHOULDERS
- FINDING MOVEMENT IN THE CHEST
- FINDING NEW MOVEMENT IN THE NECK, HEAD, AND EYES
- SEEING AND RELATING TO THE WORLD DIFFERENTLY



(Cavana, 2021)

BEING, MOVING, AND INTERACTING WITH MORE EASE WITH MYSELF AND WITH OTHER PEOPLE (especially in a foreign land)

The *soma*

- The “living, self-sensing, internalized perception of oneself [that] is radically different from the externalized perception of what we call a ‘body’” (Hanna, 1988, p. 20)
- The body as experienced from within

Hanna, Thomas. 1988. Somatics: Reawakening the Mind’s Control of Movement, Flexibility, and Health. Cambridge, MA: Da Capo Life Long.

Design research process

Wearable technology for enhancing body awareness

The Feldenkrais Method

Shusterman's *somaesthetics*

Sally Dean's *somatic costumes*

Effects of vibrotactile stimuli on somatotopy

Sarka: Sonification and Somaesthetic Appreciation Design

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ABSTRACT
We often take for granted that we have immediate access to our perception and experience of and through our bodies. But inward listening is a demanding activity and thus not easy to learn to perform or design for. With the Sarka mat we want to support the ability to direct attention by providing sound feedback linked to the weight distribution and motion intensity of different parts of the body, and to provide an exemplar for how such design may be conducted. The process of Sarka's creation is informed by Somaesthetic Appreciation Design. We discuss how a sonic feedback signal can influence listeners, followed by how we, in this design, worked to navigate the complex design space presented to us. We detail the design process involved, and the very particular set of limitations which this interactive sonification presented.

Author Keywords
Somaesthetics; Sonification; Carpet; Biofeedback; Feldenkrais; Somatic Appreciation Design; Somatic practices.

ACM Classification Keywords
H.5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

INTRODUCTION
This article details the creation of the Sarka mat: the design process involved, and the particular set of limitations this interactive sonification [13] presented. With Sarka the small movements and weight distribution of a person in supine position are interactively sonified, from the real-time data captured by 8 piezoresistive force sensors distributed across two wooden sections under the person's torso and pelvis. We often take for granted that we have immediate access to our perception and experience of and through our bodies. But inward listening is a demanding activity and thus not easy to design for. With the Sarka mat (Figure 1) we want to support the ability to direct attention by providing sound feedback of the weight distribution and motion intensity of different parts of the body. Our intention is to create a sonic feedback device that can serve as an alternative or complement to existing somatic practices and body awareness practices. Its' creation is a result of our continuing exploration on how somaesthetic theory can serve as theoretical foundation for design of technologies on or around the body. The Somaesthetics theory explores somatic practices and demonstrates how they can lead to the attainment of fulfilling experiences [29]. The process of Sarka's creation is informed by Somaesthetic Appreciation Design [14]. Briefly, it addresses how we can translate somaesthetic theory to design, opening up a design space where the interaction subtly supports users' attention inwards, towards their own body, enriching their sensitivity to, enjoyment and appreciation of their own somatics. This previous work proposes four main qualities that are essential when designing for somaesthetic appreciation: using subtle guidance of attention, providing a space for reflection, creating intimate correspondence, and encouraging the articulation of the experience. We will further expand upon somaesthetic appreciation design, and keep referring back to it throughout the article, to connect to how it has informed our design choices.

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DOI: http://dx.doi.org/10.1145/2948910.2948922

Figure 1 - Illustration of Sarka. The sewn patterns help align the body of the person lying down with the sensors underneath the mat. Cabling and speakers/headphones are not shown.

Vibrotactile and Vibroacoustic Interventions into Health and Well-Being

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Abstract

Purpose: We designed a vibrotactile vest with physiological monitoring that interacts with a vibroacoustic urban environment, *The Humming Wall*. We structured vibrotactile patterns and built a vibrotactile language to convey information and to interact towards and from the vibroacoustic environment in order to elicit sensations and encourage particular body movements. The patterns were structured to emulate calming and activating sensations and to guide or warn the vest wearer. In addition, actions such as swiping or knocking on the wall were replicated on the vest for the vest wearer, and participants could 'feel' (vibroacoustically) and hear their own heartbeats and breath rates at the wall. **Methods:** A field trial with 39 participants was conducted over a 5-week period in an urban park. Participants wearing the vest completed a set of defined tasks. We logged use and responses, videoed all activities, and conducted interviews and questionnaires post-experiment. **Results:** The results depicted the participants' experience, engagement and impressions while wearing the vibrotactile vest and interacting with the wall. The findings show convincing, strong and positive responses to novel interactions between the responsive vibroacoustic environment and the vibrotactile vest. We found compelling evidence to support further exploration into vibrotactile and vibroacoustic solutions for improving health and well-being. **Conclusions:** The work presented demonstrates the capacity for health and well-being solutions with multiple use cases. Additionally, this work constitutes the first field trial with a vibrotactile wearable responding to and driving vibroacoustic displays with an interactive vibroacoustic environment.

Keywords: wearable computing; vibrotactile; healthcare and well-being; The Humming Wall; haptic patterns; vibroacoustic;

the wall itself.

3.1 Vibrotactile vest

Fig. 2. The vibrotactile vest: adjustable harness (a) front and (b) back and (c) outer shell and skirt-apron.

The vest is made of two layers, an inner layer consisting of a one-size-fits all adjustable harness (see Fig. 2a, 2b) and an outer layer consisting of an enclosing vest (see Fig. 2c). The harness houses 32 actuators, moveable to ensure they are placed accurately on each different shaped body. The lower harness fits around the

Re-sensitising the body: interactive art and the Feldenkrais method

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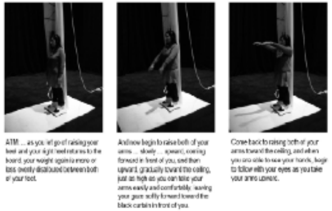
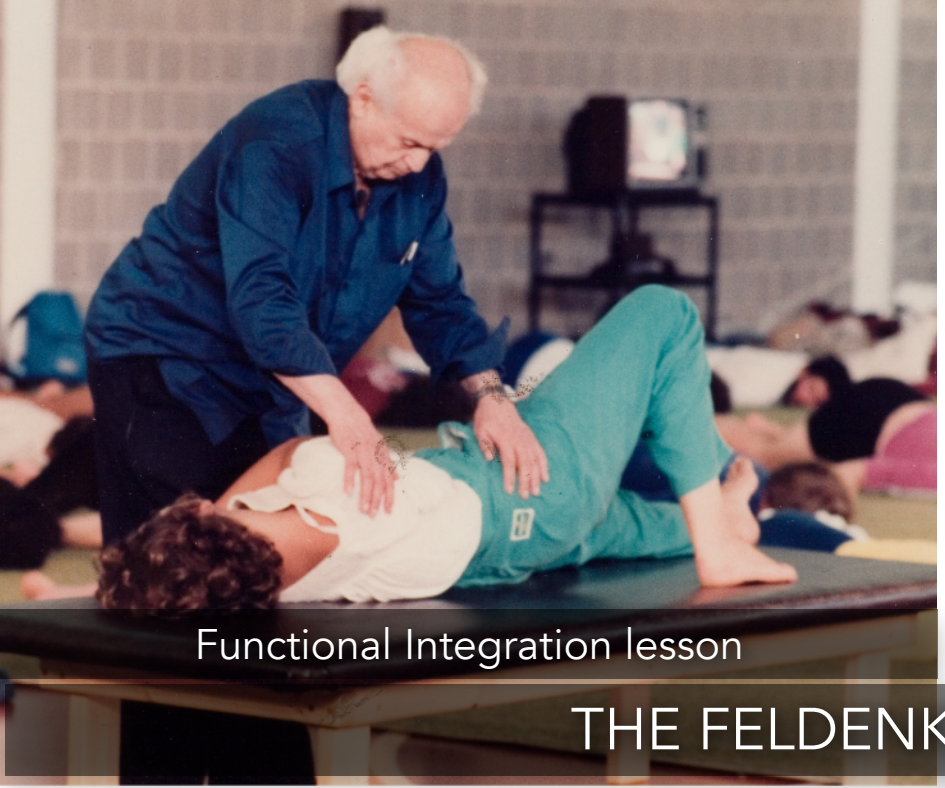
and discernment; for example, the movement of the arms forward and upward, coordinated with eye movement, was added to activate extension, a crucial functional component of this gesture – affecting expressive purpose and whole body motor efficiency.

Figure 5 shows a series of photos of an audience participant in action, annotated with excerpts from the ATM lesson.

Figure 5 A participant listening and moving to the ATM lesson



The 'lesson' builds awareness of the organisation of the body in gravity through movement. Through being invited to engage with subtle movement components of the functions of standing, reaching and balance, the participant's attention is directed toward



Functional Integration lesson

Awareness Through Movement lesson

THE FELDENKRAIS METHOD

Rywerant, Y. (2003). The Feldenkrais method: teaching by handling. North Bergen, NJ: Basic Health Publications, in association with the K.S. Giniger Co., New York, N.Y

Feldenkrais, M. (1972). Awareness through movement; health exercises for personal growth (1st ed.). New York: Harper & Row.

Just noticeable differences: The Weber-Fechner Law (or Stevens' power law?)

Fechner, G. T. (1987). Outline of a new principle of mathematical psychology (1851). Psychological Research, 49(4), 203–207. https://doi.org/10.1007/BF00309027

Stevens, S. (1957). On the psychophysical law. Psychological Review, 64(3), 153–181. https://doi.org/10.1037/h0046162

“a short, non-intrusive sensorimotor intervention (based on the Feldenkrais Method) can have short-term effects on spontaneous cortical activity in functionally related brain regions”

Verrel, J., Almagor, E., Schumann, F., Lindenberger, U., & Kühn, S. (2015). Changes in neural resting state activity in primary and higher-order motor areas induced by a short sensorimotor intervention based on the Feldenkrais method. Frontiers in Human Neuroscience, 9. http://dx.doi.org/10.3389/fnhum.2015.00232

- **Pain** (Lundblad et al, 1999; Lundqvist et al., 2014)
- **Self-regulation** (Ives, 2003)
- **Interoceptive awareness** (Paolucci et al., 2016)
- **Quality of life in individuals with degenerative neuromuscular disease** (Teixeira-Machado et al., 2015)

Ives, J. C. (2003). Comments on "The Feldenkrais Method®: A Dynamic Approach to Changing Motor Behavior." Research Quarterly for Exercise and Sport, 74(2), 116–123. https://doi.org/10.1080/02701367.2003.10609072

Lundblad, I., Elert, J., & Gerdle, B. (1999). Randomized Controlled Trial of Physiotherapy and Feldenkrais Interventions in Female Workers with Neck-Shoulder Complaints. Journal of Occupational Rehabilitation, 9(3), 179–194. https://doi.org/10.1023/A:1021301801292

Lundqvist, L.-O., Zetterlund, C., & Richter, H. O. (2014). Effects of Feldenkrais Method on Chronic Neck/Scapular Pain in People With Visual Impairment: A Randomized Controlled Trial With One-Year Follow-Up. Archives of Physical Medicine and Rehabilitation, 95(9), 1656–1661. https://doi.org/10.1016/j.apmr.2014.05.013

Paolucci, T., Zangrando, F., Iosa, M., Angelis, S. D., Marzoli, C., Piccinini, G., & Saraceni, V. M. (2016). Improved interoceptive awareness in chronic low back pain: a comparison of Back school versus Feldenkrais method. Disability and Rehabilitation, 0(0), 1–8. https://doi.org/10.1080/09638288.2016.1175035

Teixeira-Machado, L., Araujo, F., Cunha, F., Menezes, M., Menezes, T., & DeSantana, J. (2015). Feldenkrais method-based exercise improves quality of life in individuals with Parkinson's disease: a controlled, randomized clinical trial. The Journal of Pain - Abstracts Presented at the 34th Annual Scientific Meeting of the American Pain Society, 16(4, Supplement), S113. https://doi.org/10.1016/j.jpain.2015.01.471

Learning principles in the Feldenkrais Method…

… to help with refining the self-image

- Creating a learning environment that affords safe, distraction-free attentiveness
- Facilitating curiosity and not correcting errors
- Moving gently and within the range of comfort in order to perceive just noticeable differences
- Experiencing ease after variation, complexity, and temporary restriction
- Providing opportunities for making distinctions by using bilateral symmetry
- Using oscillation to explore movement reversibility
- Resting

Learning principles in the Feldenkrais Method…

~~*"Move your body"*~~

"Move yourself"

You are your body ***and*** *you have a body (*Shusterman, 2008)

Shusterman, Richard. 2008. Body Consciousness: A Philosophy of Mindfulness and Somaesthetics. Cambridge; New York: Cambridge University Press.

Somatic costumes (Dean, 2014)

Dean, S. E. (2014). Amerta Movement & Somatic Costume: Sourcing the Ecological Image. In K. Bloom, M. Galanter, & S. Reeve (Eds.), Embodied Lives: Reflections on the Influence of Suprapto Suryodarmo and Amerta Movement.

Effects of vibrotactile stimuli on cortical representation of motor action

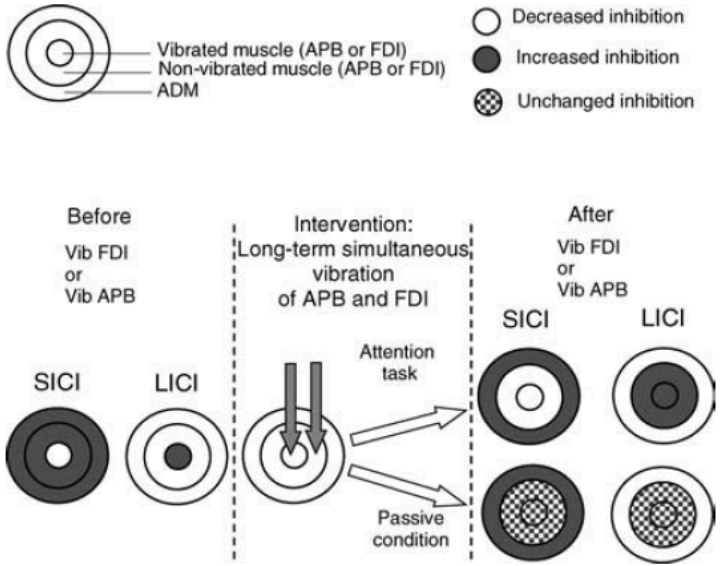


Figure 6. Schematic summary of the effects of focal vibratory input on SICI and LICI in the three hand muscles
In this diagram, the hand muscle representations are drawn as circles with the vibrated muscle (either APB or FDI) in the centre, and the 'near' (either FDI or APB) and 'far' (always ADM) non-vibrated muscles surrounding it. Shades represent the level of intracortical inhibition: white symbolizes a reduction of SICI or LICI, grey an increase, and patterned, an unchanged SICI or LICI compared to the non-vibration condition. Before the intervention (baseline), short-term vibration of one muscle reduces SICI in that muscle ('homotopic' effect) and increases it in other muscles ('heterotopic' effect), as symbolized here by the white centre surrounded by grey for SICI, and vice versa for LICI. After the long-term simultaneous vibration of the APB and FDI, the 'homotopic' effect of vibration spreads onto the co-vibrated muscle if subjects had attended to the vibratory stimulus (attention task). If subjects did not attend, vibration of either FDI or APB no longer had any effect on FDI or APB. The 'heterotopic' effects of short-term APB or FDI vibration on the ADM are preserved.

Rosenkranz, K., & Rothwell, J. C. (2003). Differential effect of muscle vibration on intracortical inhibitory circuits in humans. The Journal of Physiology, 551(2), 649–660. https://doi.org/10.1113/jphysiol.2003.043752

Rosenkranz, K., & Rothwell, J. C. (2004). The effect of sensory input and attention on the sensorimotor organization of the hand area of the human motor cortex. The Journal of Physiology, 561(1), 307–320. https://doi.org/10.1113/jphysiol.2004.069328

Effects of vibrotactile stimuli on cortical representation of motor action

"The objective was to investigate if whole-hand mechanical stimulation (MSTIM) in the tapping-flutter frequency range induces outlasting post-stimulus changes in the hand region of the primary motor cortex. MSTIM was delivered to 12 healthy subjects for 20 min using a therapeutic stimulation device (Swisswing BMR 2000)… We conclude that 20 min MSTIM with a frequency of 25 Hz induces outlasting plastic changes in the primary motor cortex. Paired-pulse stimulation further confirms that intrinsic intracortical mechanisms are involved in these changes… These results could be of relevance for hemiplegic patients with motor deficits, to improve the rehabilitation outcome with vibration exercise in combination with motor training.

Christova, M., Rafolt, D., Golaszewski, S., & Gallasch, E. (2011). Outlasting corticomotor excitability changes induced by 25 Hz whole-hand mechanical stimulation. European Journal of Applied Physiology, 111(12), 3051–3059. https://doi.org/10.1007/s00421-011-1933-0

Effect of cutaneous electrical stimulation on cortical representation of motor action

“The long-term effect of daily somatosensory stimulation with transcutaneous electrical nerve stimulation (TENS) on reorganization of the motor cortex was investigated in a group of neurologically intact humans. The scalp representation of the corticospinal projection to the finger (APB, ADM) and forearm (FCR, ECR) muscles was mapped by means of transcranial magnetic stimulation (TMS) before and after a 3-week intervention period, using map area and volume, and topographical overlaps between the cortical motor representations of these muscles as primary dependent measures. Findings revealed a significant increase in cortical motor representation of all four muscles for the TENS group from pre to posttest (all, P 0.026). No significant changes in cortical motor representations were observed in the control group.”

Meesen, R. L. J., Cuypers, K., Rothwell, J. C., Swinnen, S. P., & Levin, O. (2011). The effect of long-term TENS on persistent neuroplastic changes in the human cerebral cortex. Human Brain Mapping, 32(6), 872–882. https://doi.org/10.1002/hbm.21075

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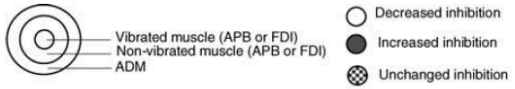
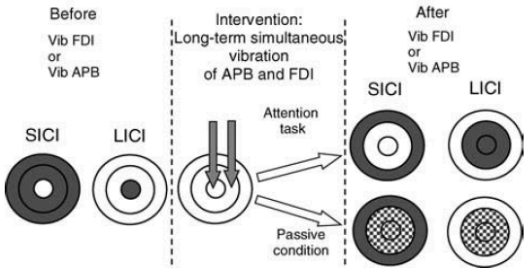
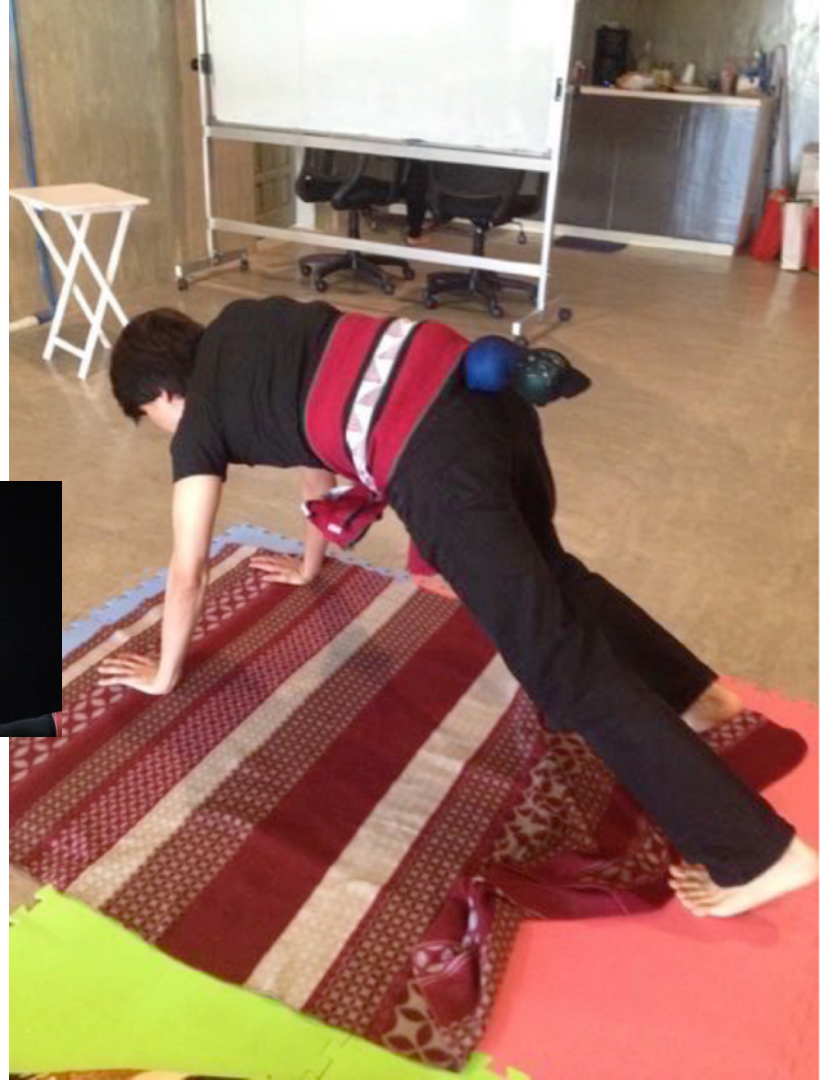
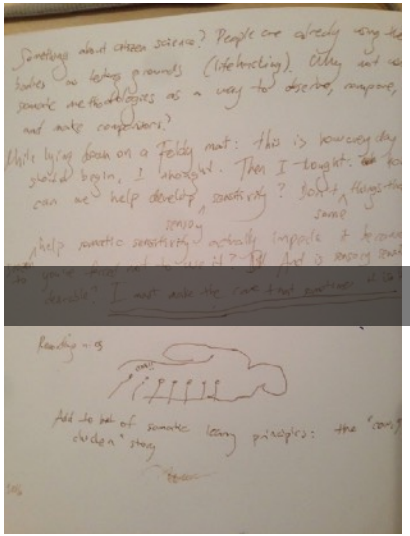

Vibrated muscle (APB or FDI)
Non-vibrated muscle (APB or FDI)
ADM
Decreased inhibition
Increased inhibition
Unchanged inhibition


Before
Vib FDI
or
Vib APB
Intervention:
Long-term simultaneous
vibration
of APB and FDI
After
Vib FDI
or
Vib APB
SICI
LICI
Attention
task
SICI
LICI
Passive
condition

= ????





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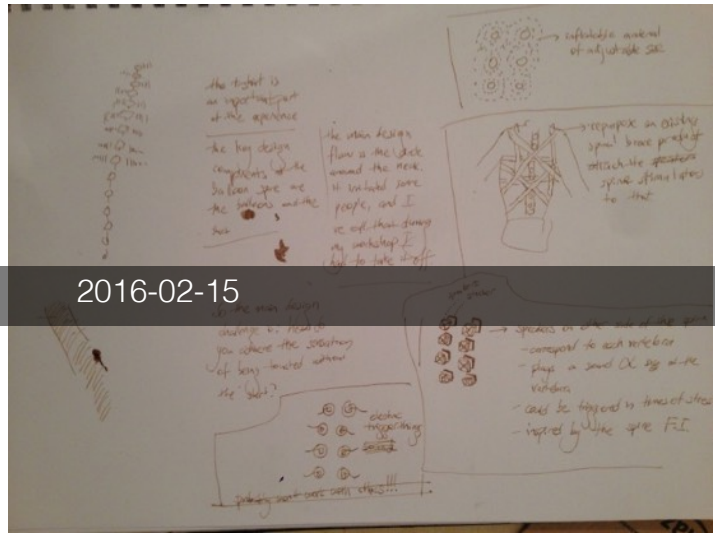

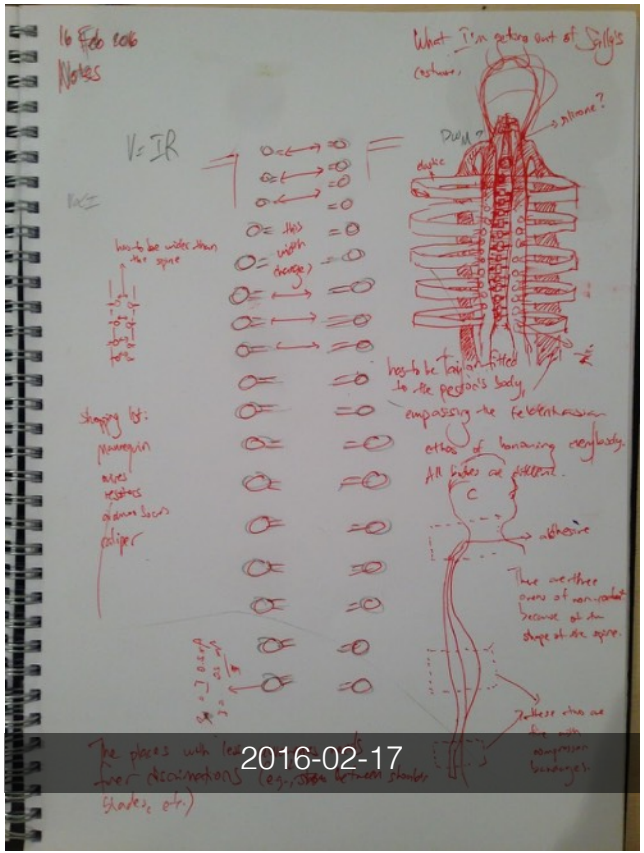

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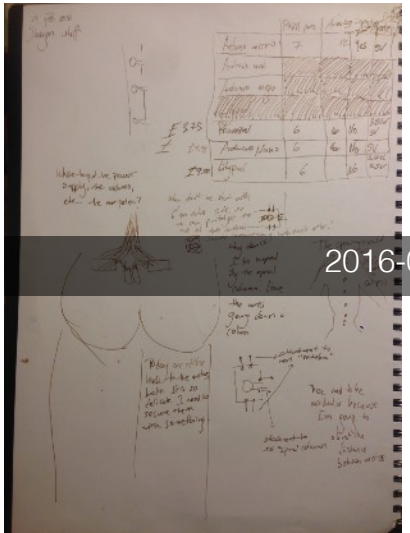

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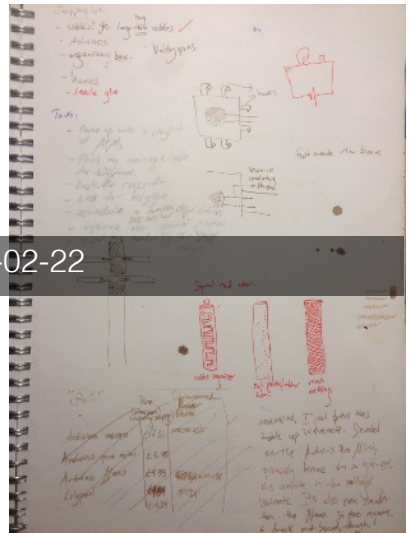


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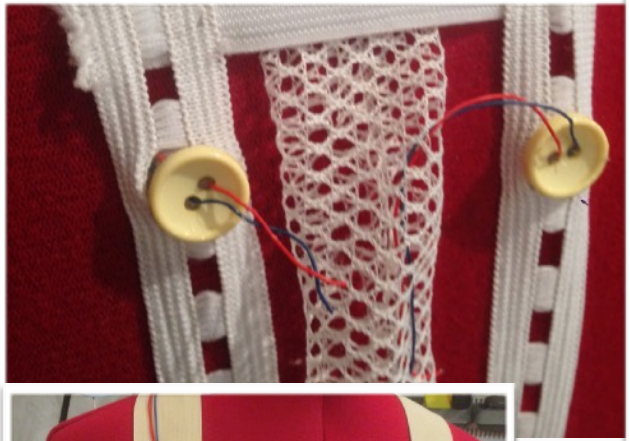
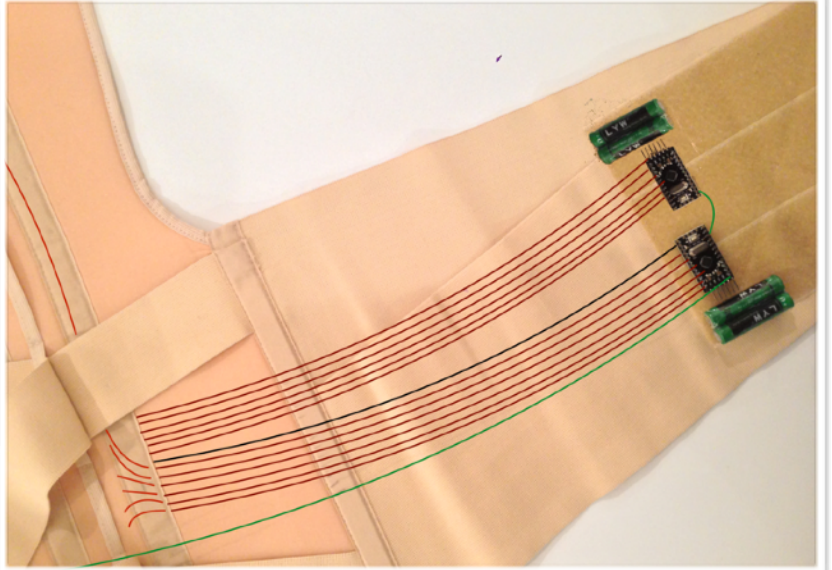
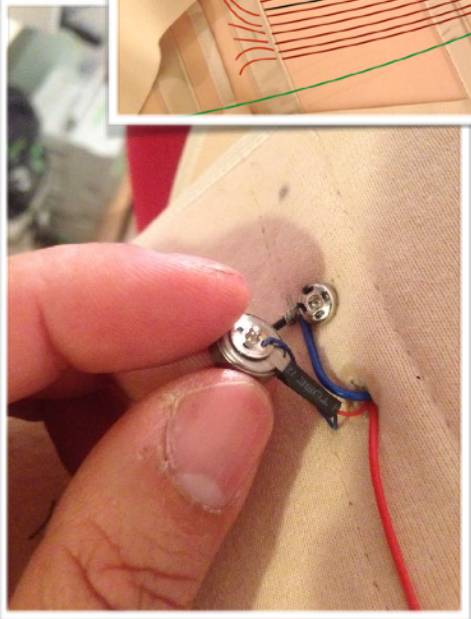
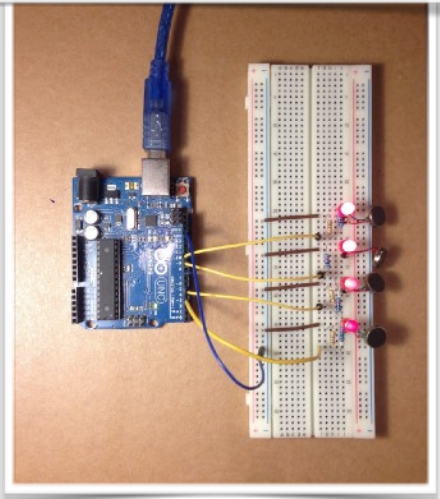
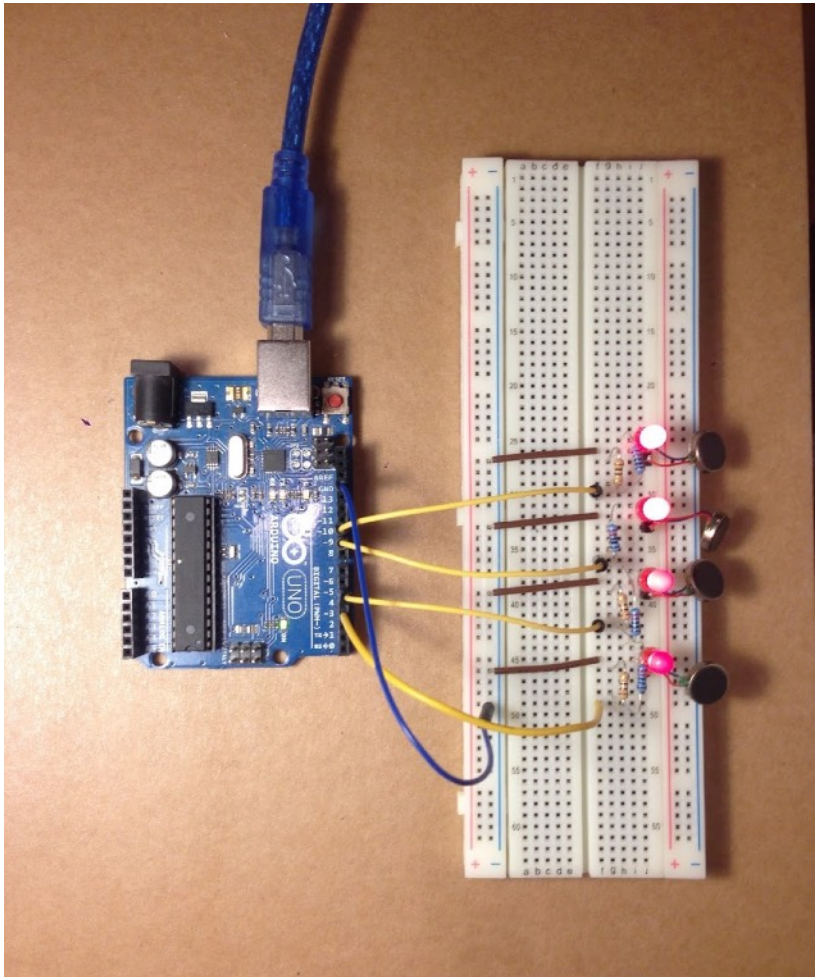


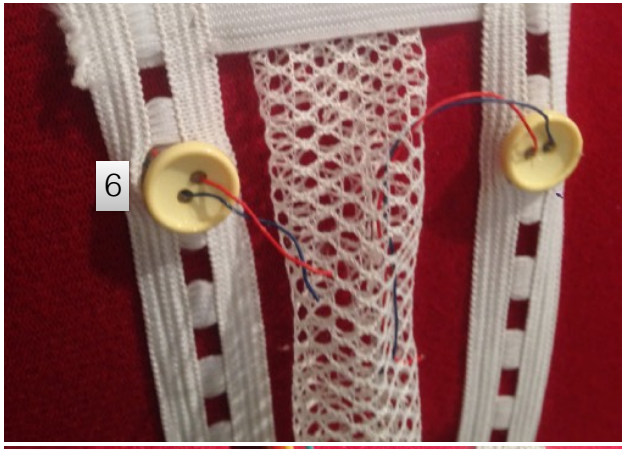


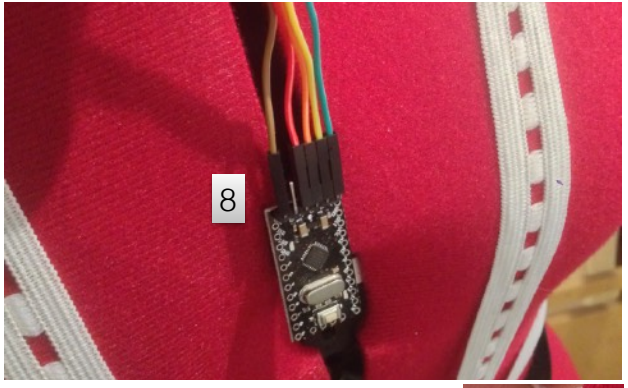


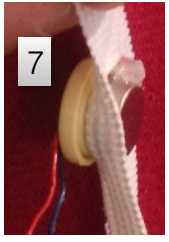


2016-02-17

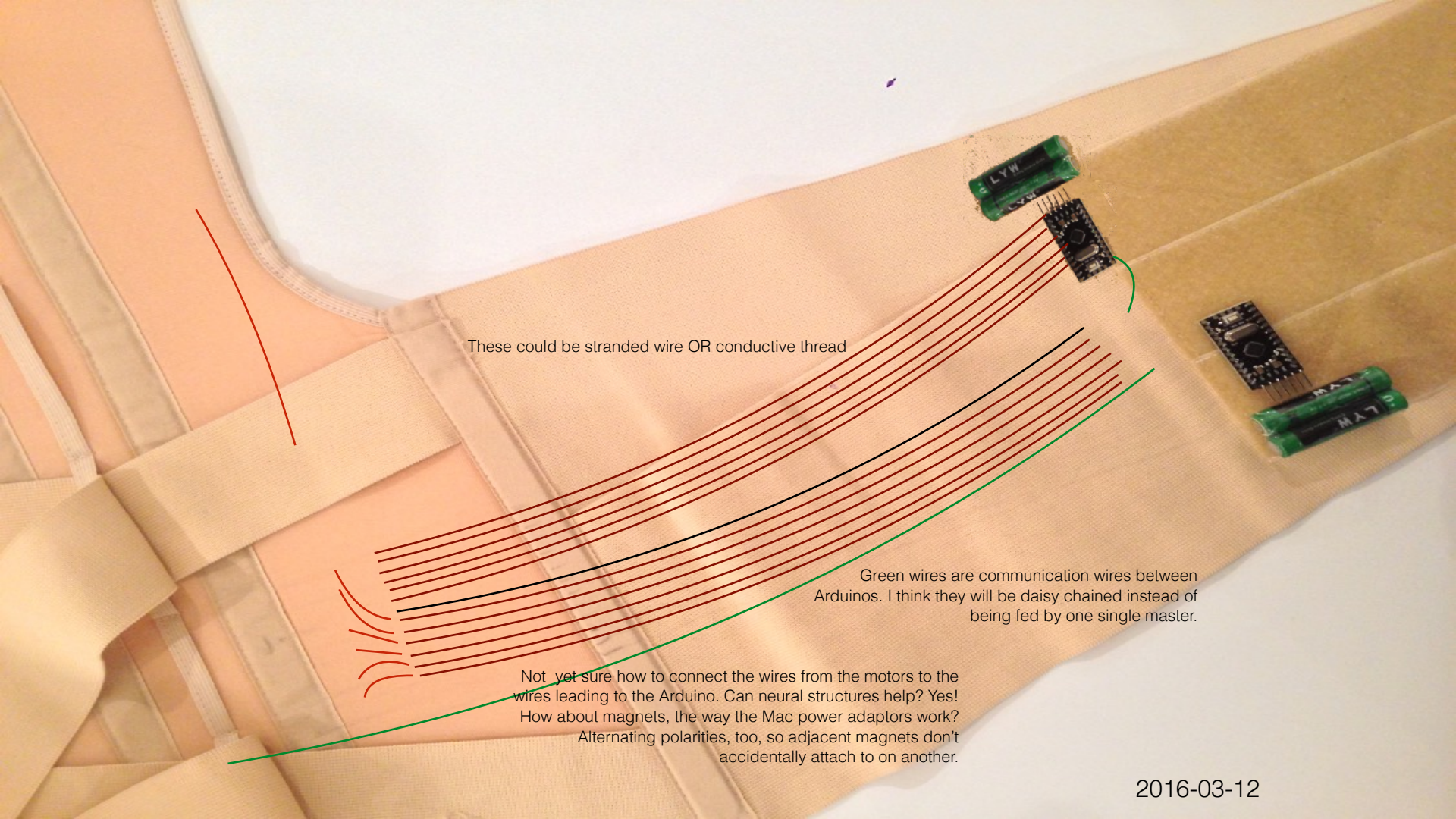




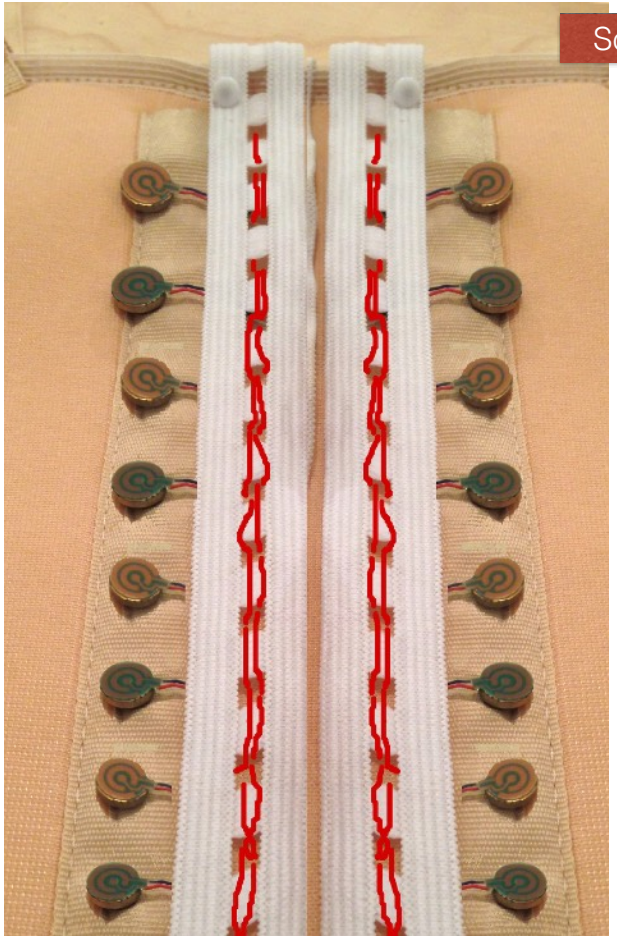




2016-03-08

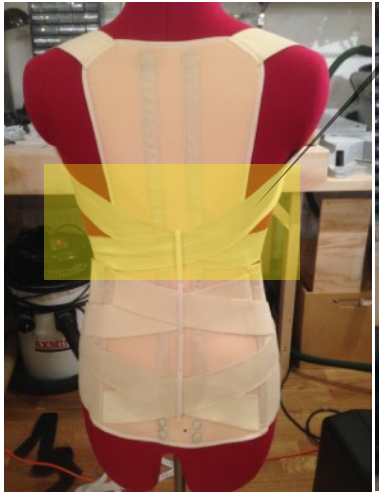

These could be stranded wire OR conductive thread
Green wires are communication wires between Arduinos. I think they will be daisy chained instead of being fed by one single master.
Not yet sure how to connect the wires from the motors to the wires leading to the Arduino. Can neural structures help? Yes! How about magnets, the way the Mac power adaptors work? Alternating polarities, too, so adjacent magnets don't accidentally attach to on another.
2016-03-12

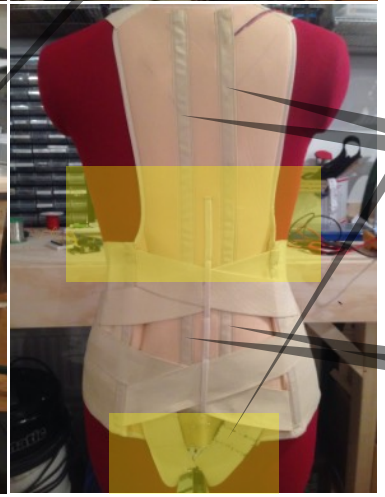
Schematic



This solution has several advantages over user a a single wire mesh “spinal column”:

1) Keeps the wires tight and neat
2) Because of the other features in the back of the brace, i have to bifurcate the spinal column at some point anyway. Better bifurcate now than later.
3) The elastic band has some structure to it (related to point 1). but this also means that i can sew in additional components if needed (e.g., resistors).
4) I could also put the magnet attachment solution here as opposed to the obliques. However, that would mean sewing a lot of conductive thread down the spine. I want to minimise the use of conductive thread. Also, this begins to really limit the number of motors I can put on. I could always just use thinner wires f i decide to increase the number of motors (e.g., half the gauge and double the number of motors, approximately)





I repurposed the shoulder straps (originally used as thoracic braces)…

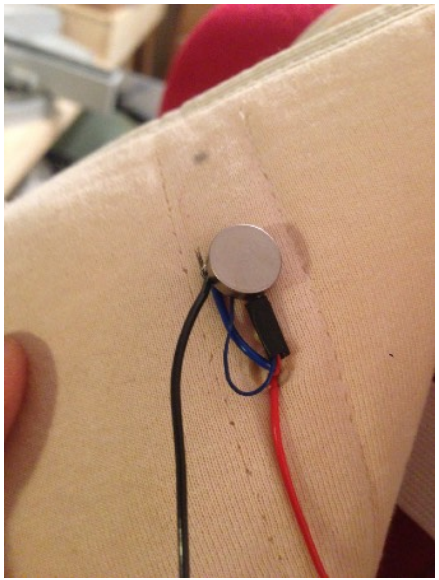
… into pelvis supporters.

Removed the metallic braces across the thorax and lumbar areas

but kept the plastic braces because it would help keep the material taught across the back

2016-03-14

Experimenting with different placement positions for the Arduino boards and the battery



Found a way to easily reposition and power motors: have the entire snap fastener act as a ground connection.

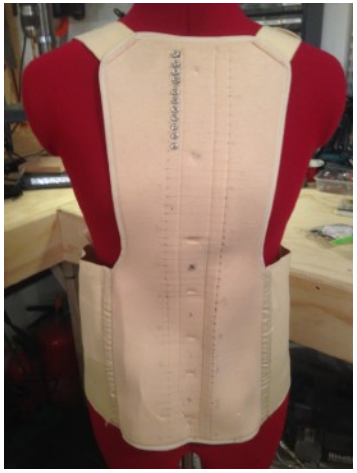
2016-03-14

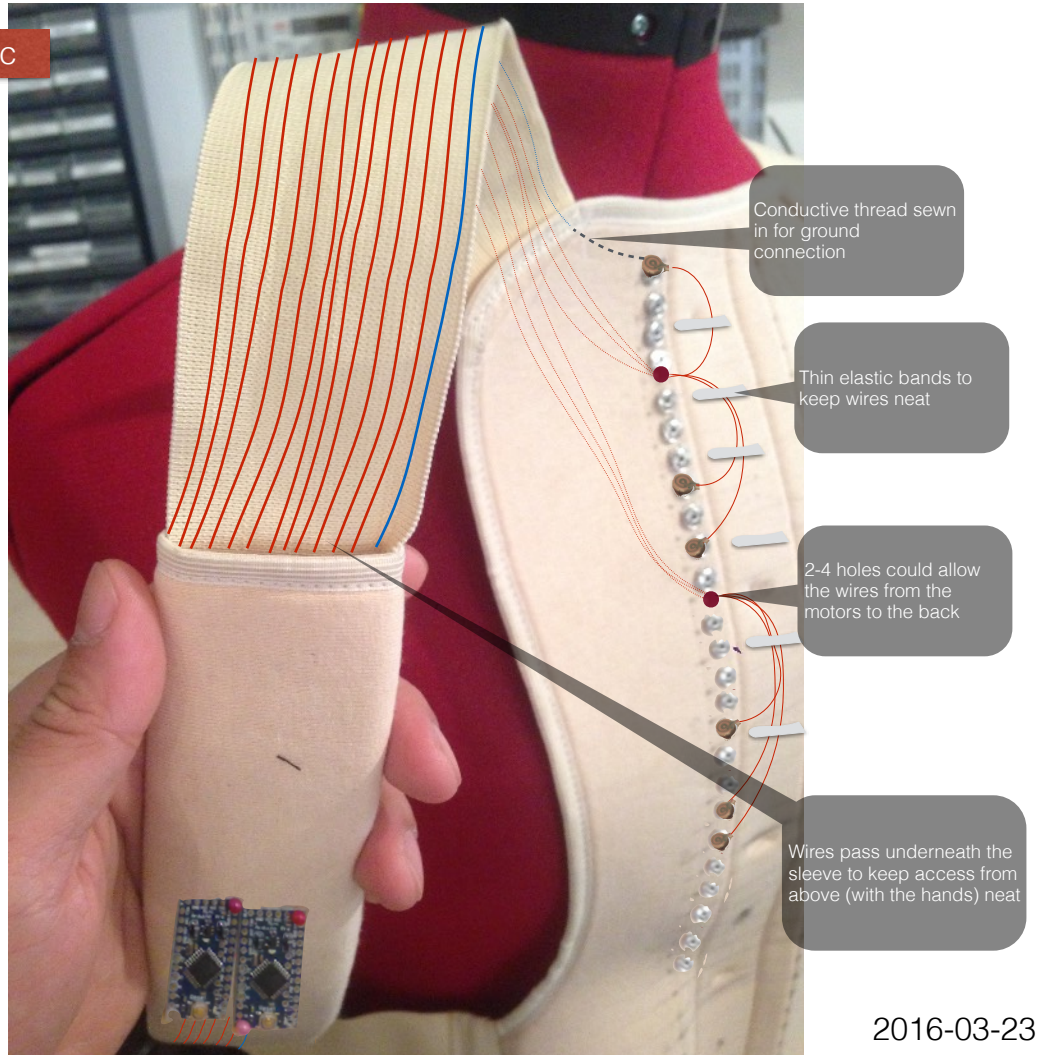
Schematic

Special extension for the cervical spine must not create a feeling of constriction around the back of the neck and the throat, which some participants felt during my workshop in Manila when trying out the “ballon spine legs costume”

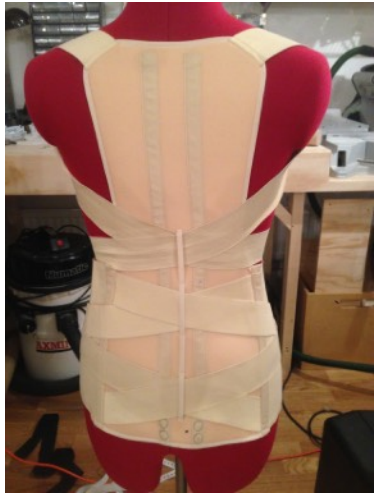
2016-03-14

Schematic





2016-03-23



Modified back support brace

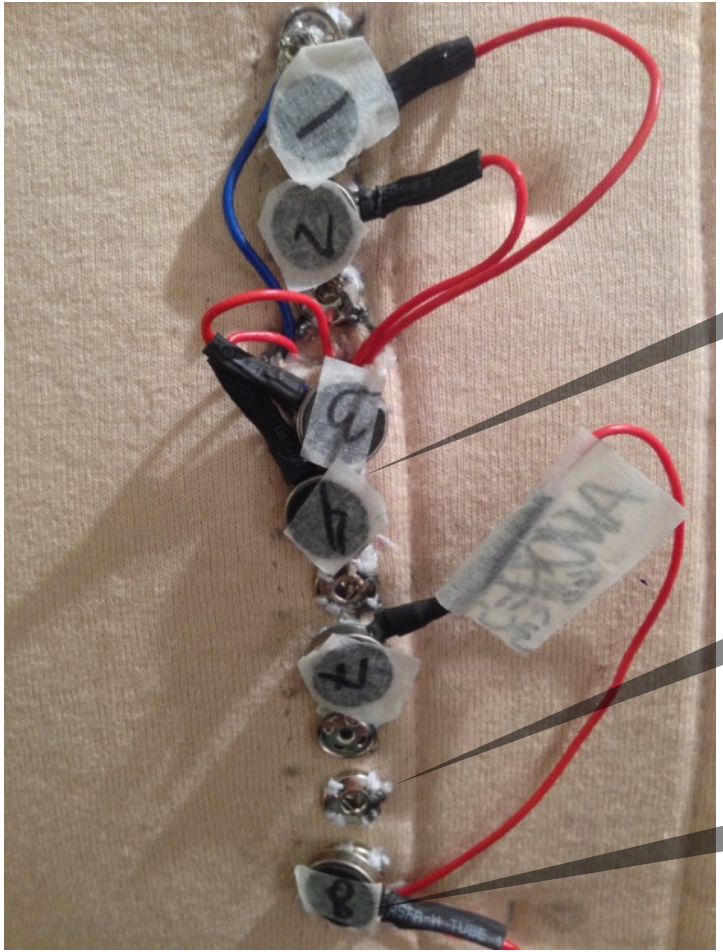
Modified clothing and accessories (e.g., men's braces/ suspenders)

Very light, custom-built, undergarment

Directly stuck on skin (using skin-specific adhesive)

Different planned versions of how Haplós can interface with the body. Currently developing version 2.

2016-03-29

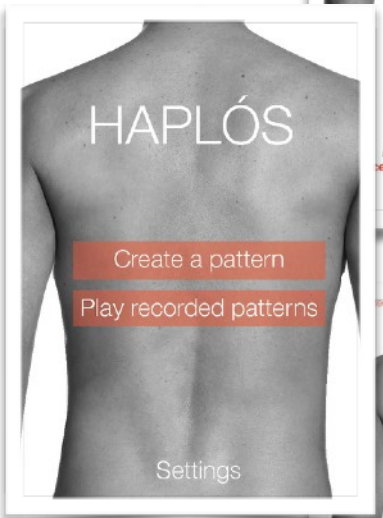


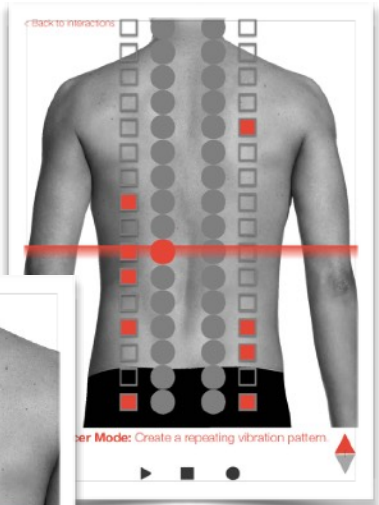
Snap spacing may need to be optimised so that motors can sit comfortably one after another.

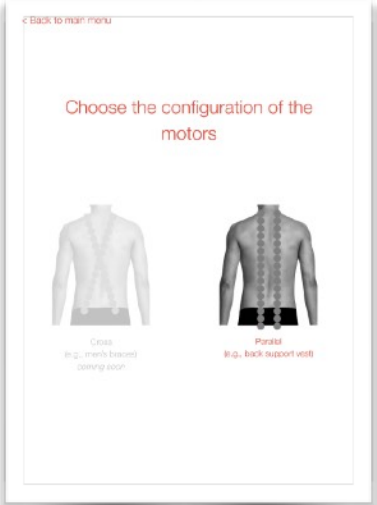
Snaps may need to be sewn on entirely using conductive thread, or may need to be soldered on!

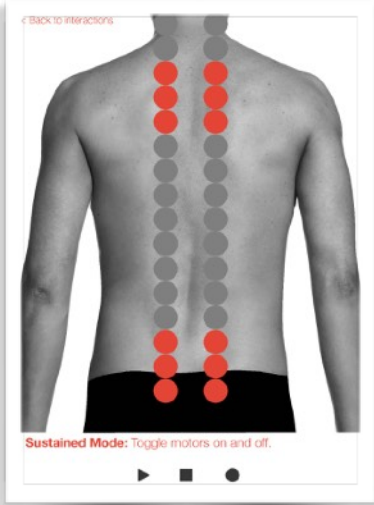
After plugging all six motors into one Arduino Pro Mini, realised that the battery source needs to have sufficient amperage, otherwise the motors are too gentle! But otherwise, i think this will do the trick. I powered this with a smartphone power bank.

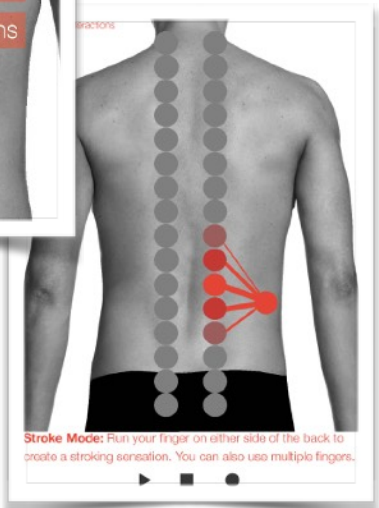
2016-03-29

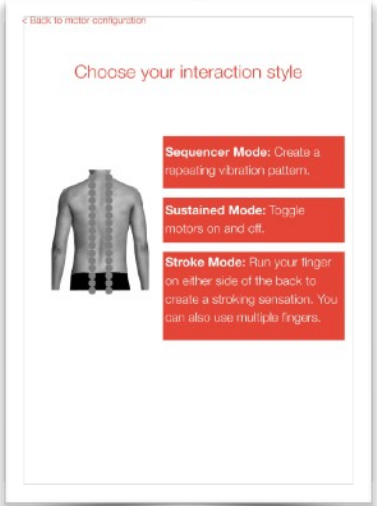

HAPLÓS
Create a pattern
Play recorded patterns
Settings


Back to interactions
er Mode: Create a repeating vibration pattern.

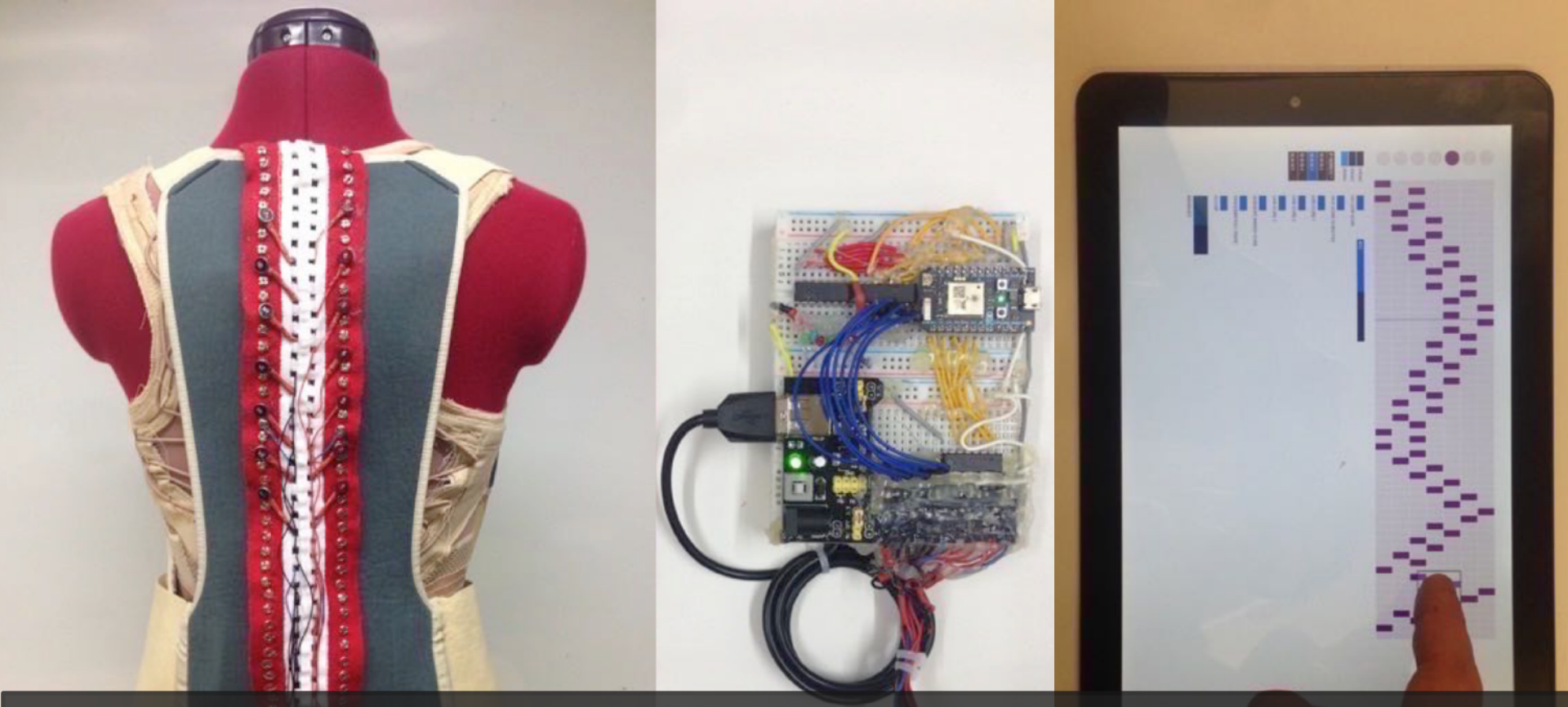

Back to main menu
Choose the configuration of the motors
Cross
(e.g., men's braces)
coming soon
Parallel
(e.g., back support vest)


Back to interactions
Sustained Mode: Toggle motors on and off.

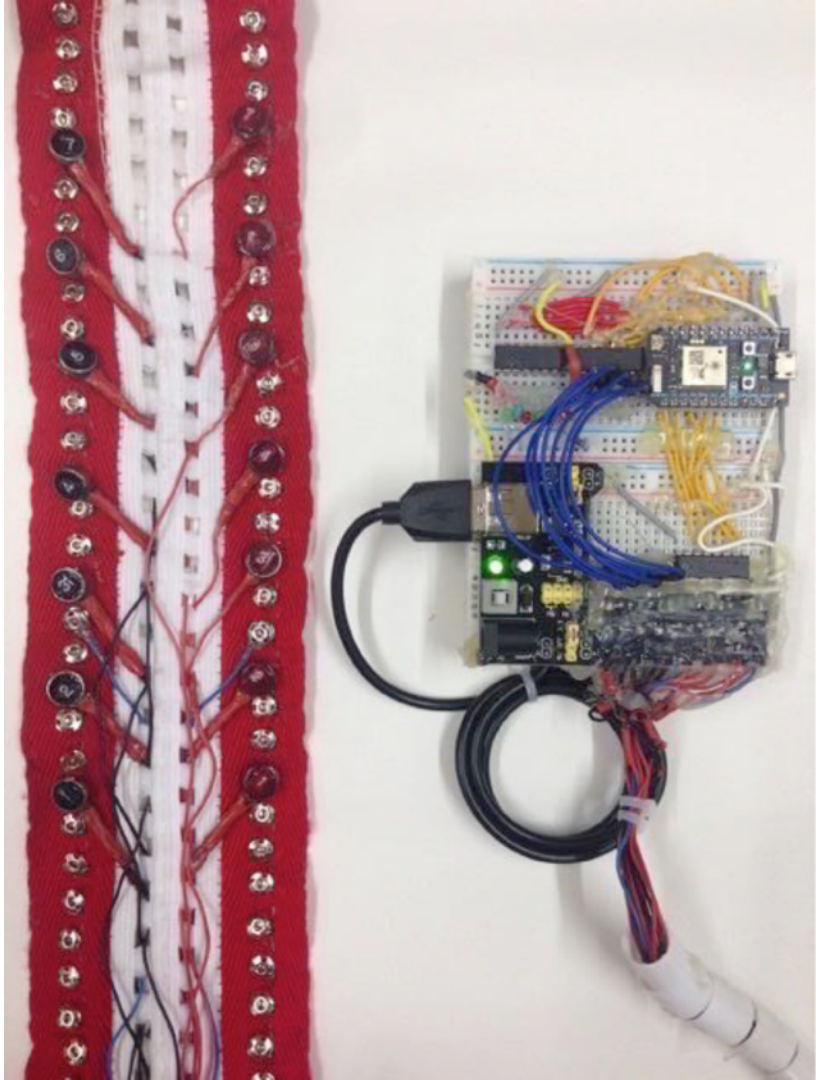

Stroke Mode: Run your finger on either side of the back to create a stroking sensation. You can also use multiple fingers.

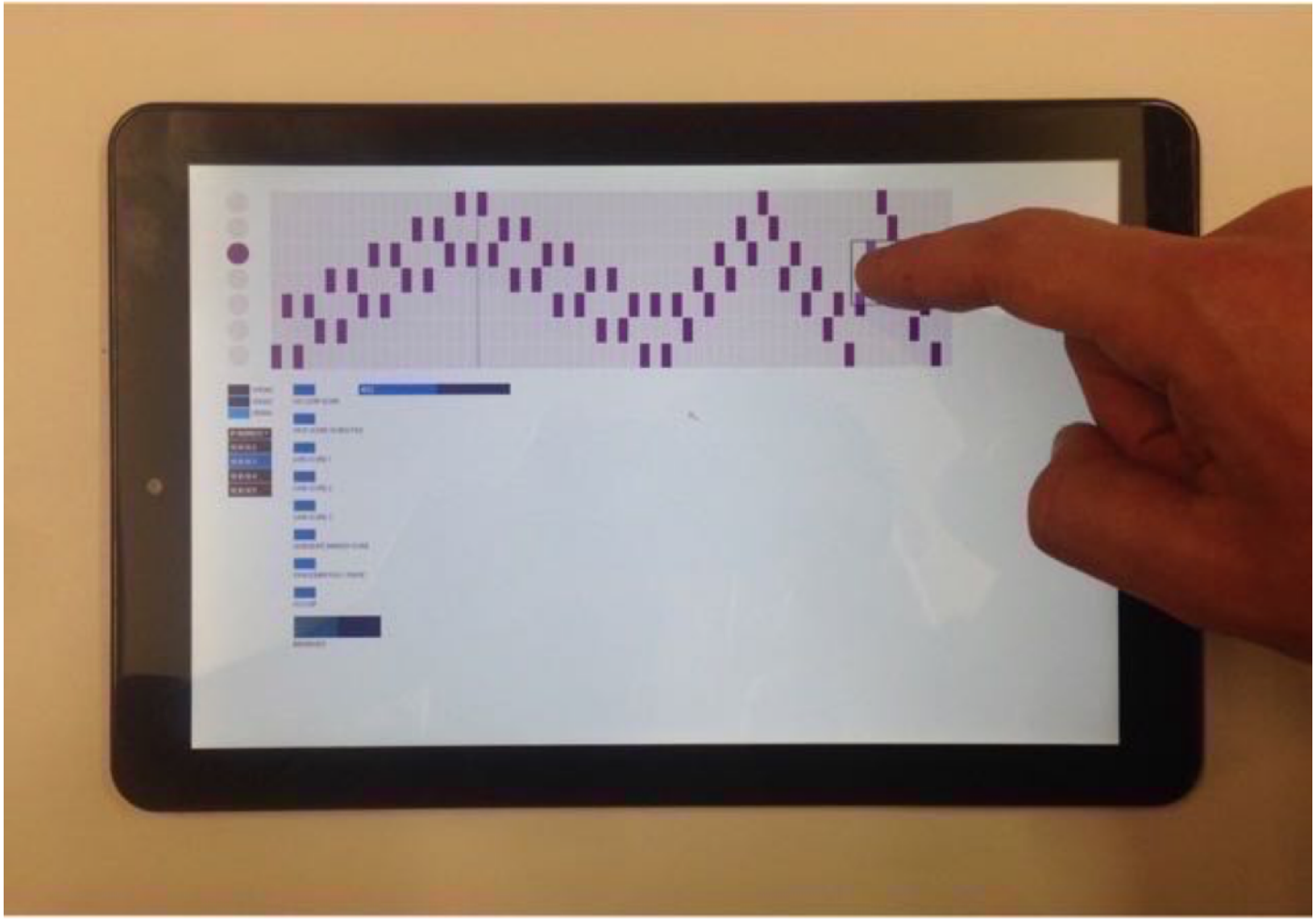

Back to motor configuration
Choose your interaction style
Sequencer Mode: Create a repeating vibration pattern.
Sustained Mode: Toggle motors on and off.
Stroke Mode: Run your finger on either side of the back to create a stroking sensation. You can also use multiple fingers.


Back to main menu
Length
Type
Name
Notes
Date



Maranan, Diego S., Jane Grant, John Matthias, Mike Phillips, and Susan L. Denham. 2020. “Haplós: Vibrotactile Somaesthetic Technology for Body Awareness (Paper).” In Proceedings of the Fourteenth International Conference on Tangible, Embedded, and Embodied Interaction, 539–43. TEI ’20. Sydney NSW, Australia: Association for Computing Machinery. https://doi.org/10.1145/3374920.3374984.





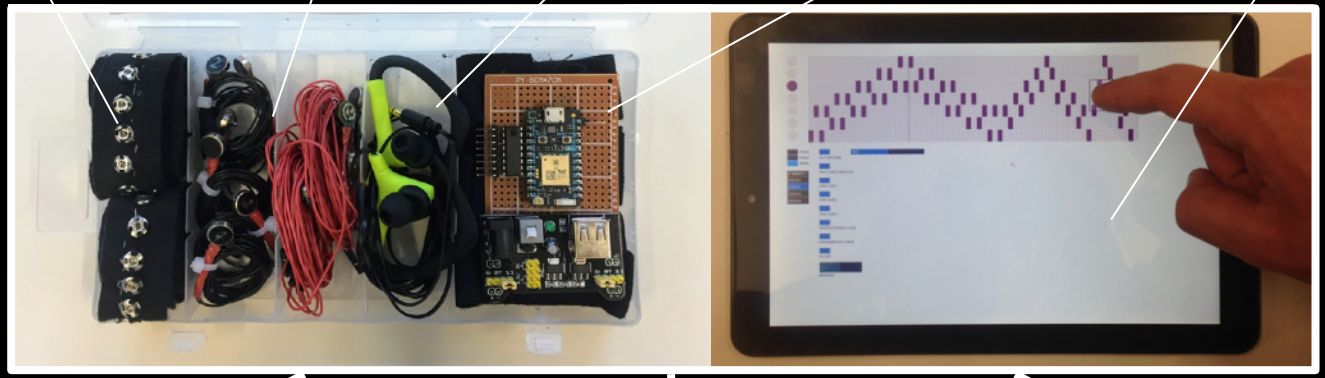
REATTACHMENT SYSTEM

REATTACHABLE MOTORS

EARPHONES

WIFI-READY MICROCONTROLLER

VIBROTACTILE + SOUND COMPOSITION SOFTWARE



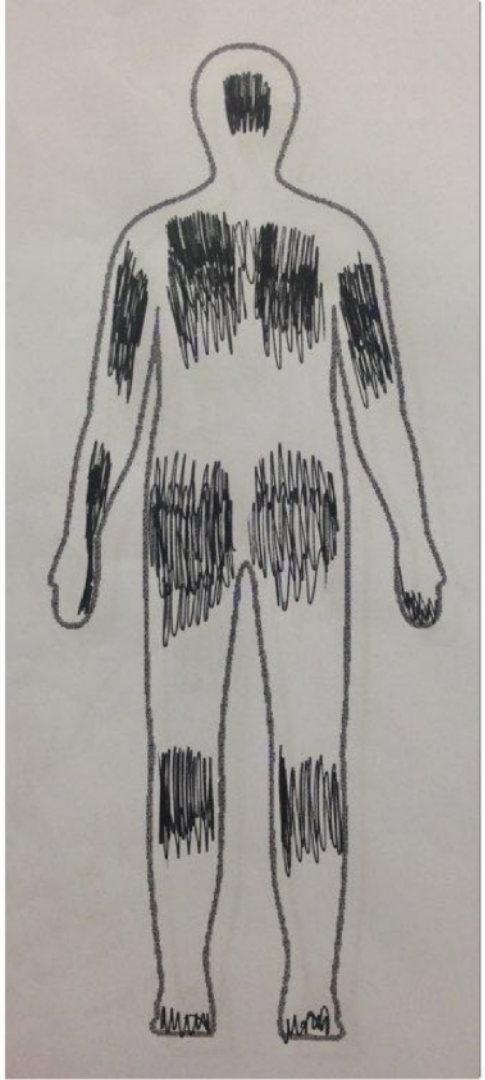
EQUIPMENT

FURNITURE

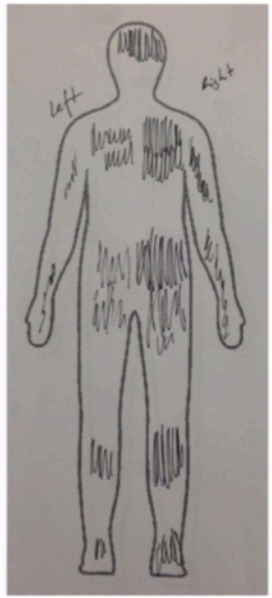
CLOTHING

Evaluation

Workshops n=8
Public




R

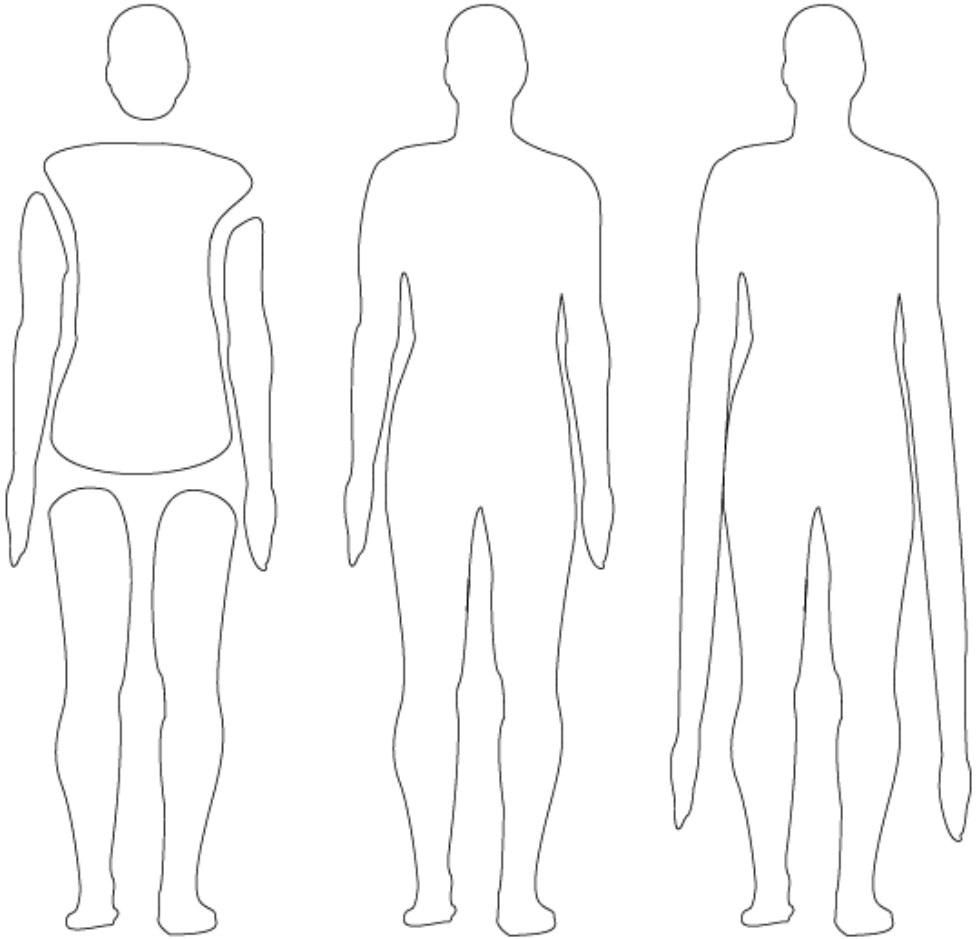

left
right


left
right

[I could] feel more of myself ... I couldn’t feel myself as much before.
(#P22.161022.PublicDemo.a5)

Definitely felt more sensation/awareness of this particular spot... I just notice my back a lot more from doing that
(#P10.161020.Manufactory1.a5)

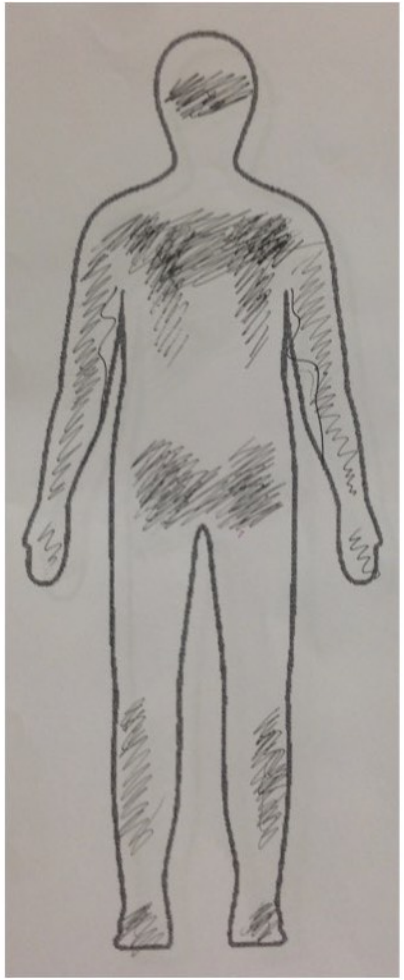
Was slightly more aware of my left side than i was beforehand... i was more sensitive to its location and which parts were making contact with the floor. so if anything, the resolution with which i can feel my back increased. i feel like i have a sharper image.
(#P14.161020.Manufactory1.a5)

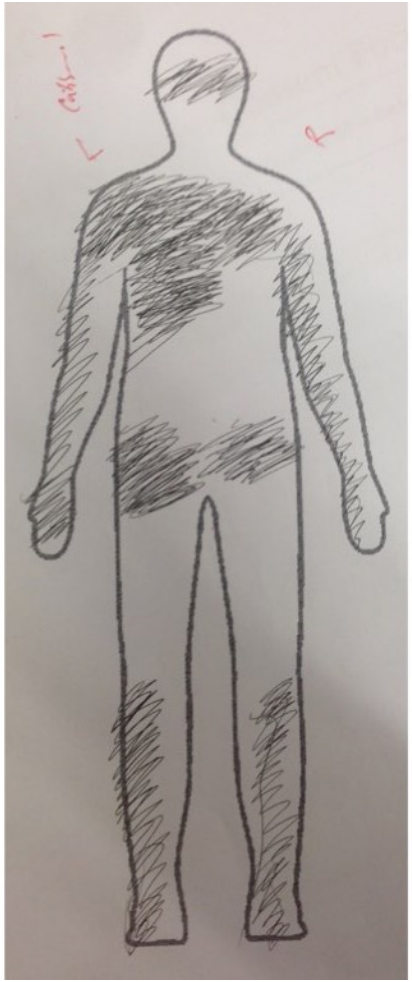


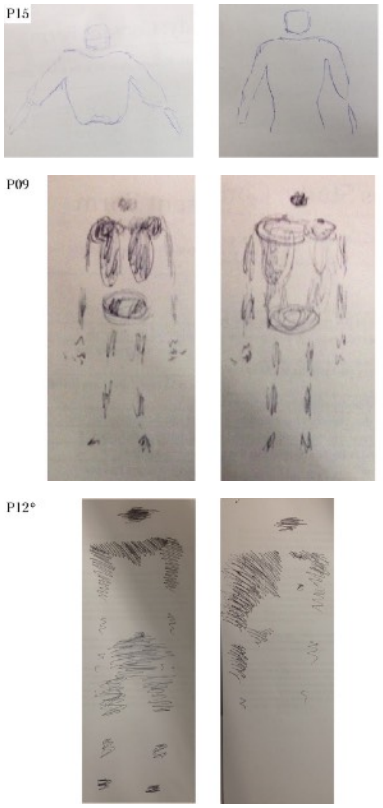
RE/CONNECT : RE/IMAGINE

RE/ME

BODILY WELL-BEING
BODILY CREATIVITY



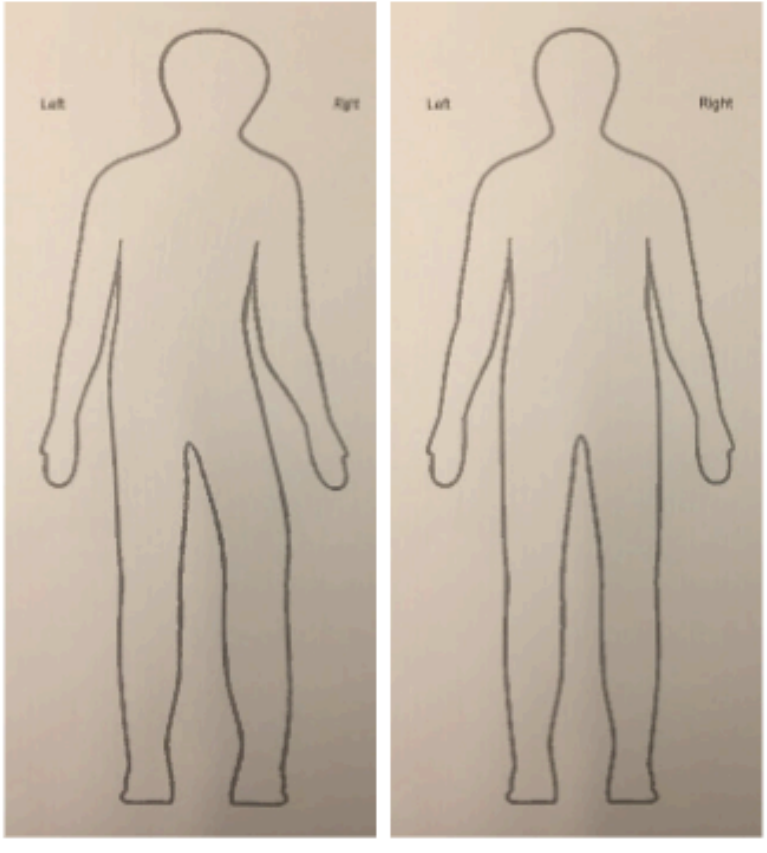




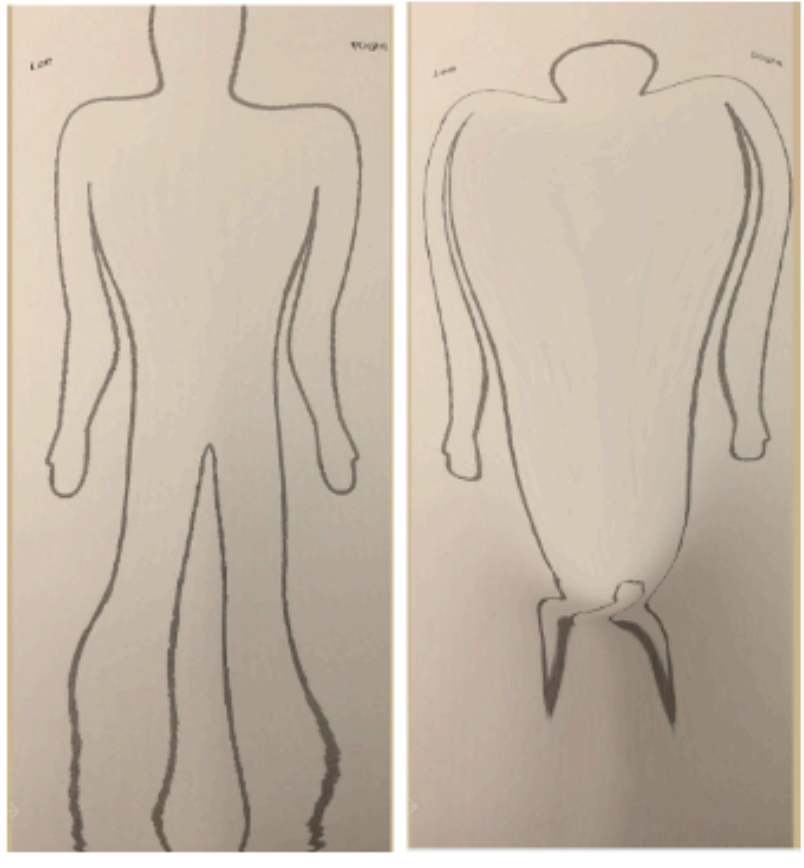
RE/ME

measurably fills in gaps in awareness in one's body.

Maranan, D. S. (2017). *Haplós: Towards Technologies for and Applications of Somaesthetics* (PhD thesis). Plymouth University, UK.



Before and after (example 1)



Before and after (example 2)

Design research process

Wearable technology for enhancing body awareness

The Feldenkrais Method

Shusterman's *somaesthetics*

Sally Dean's *somatic costumes*

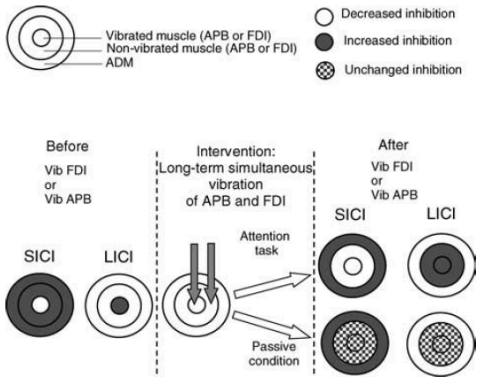
Effects of vibrotactile stimuli on somatotopy

Wearable technology for enhancing body awareness

Wearable technology to aid with refining the self-image

Wearable technology for enhancing body awareness

Wearable technology to aid with transforming the felt experience of the body (soma)



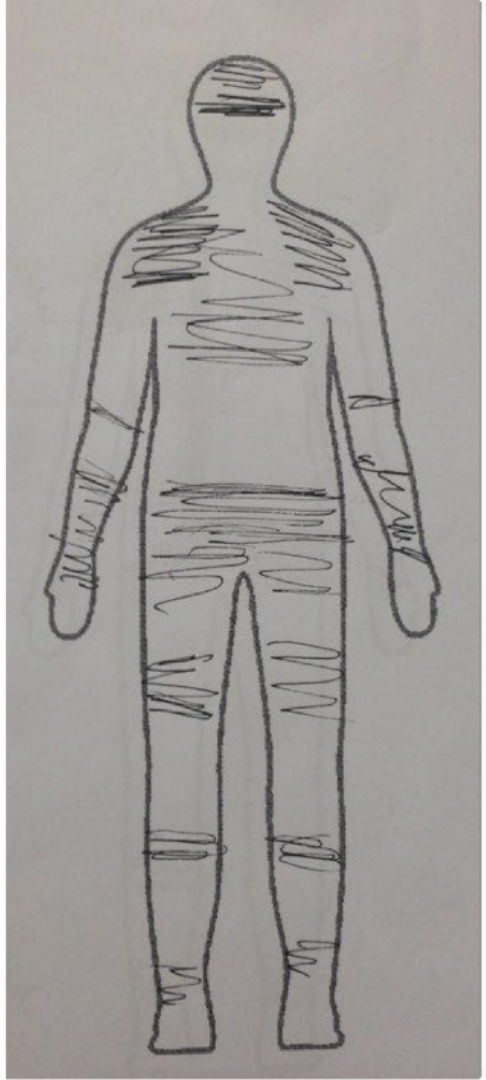
Wearable technology for enhancing body awareness

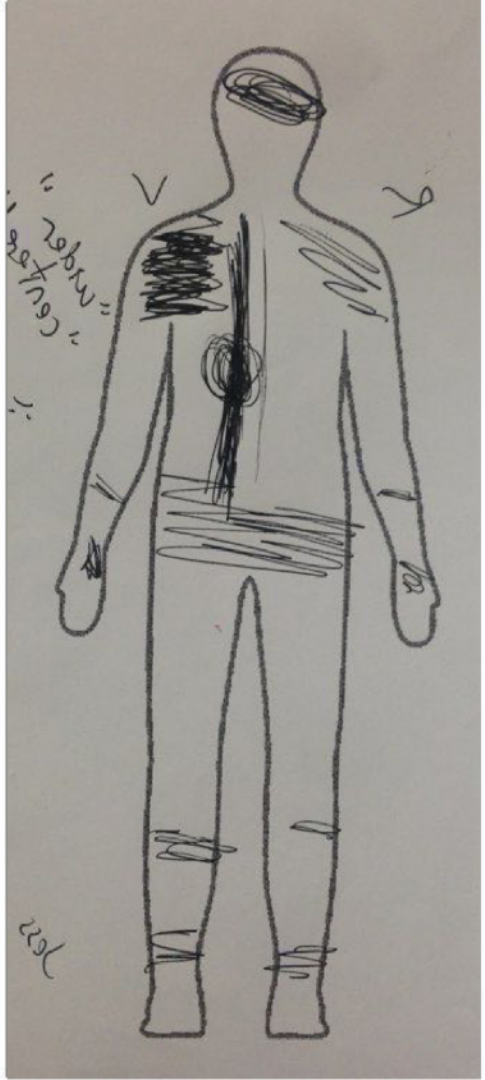
Wearable technology to increase the resolution of bodily representations in the somatosensory cortex

THANK YOU

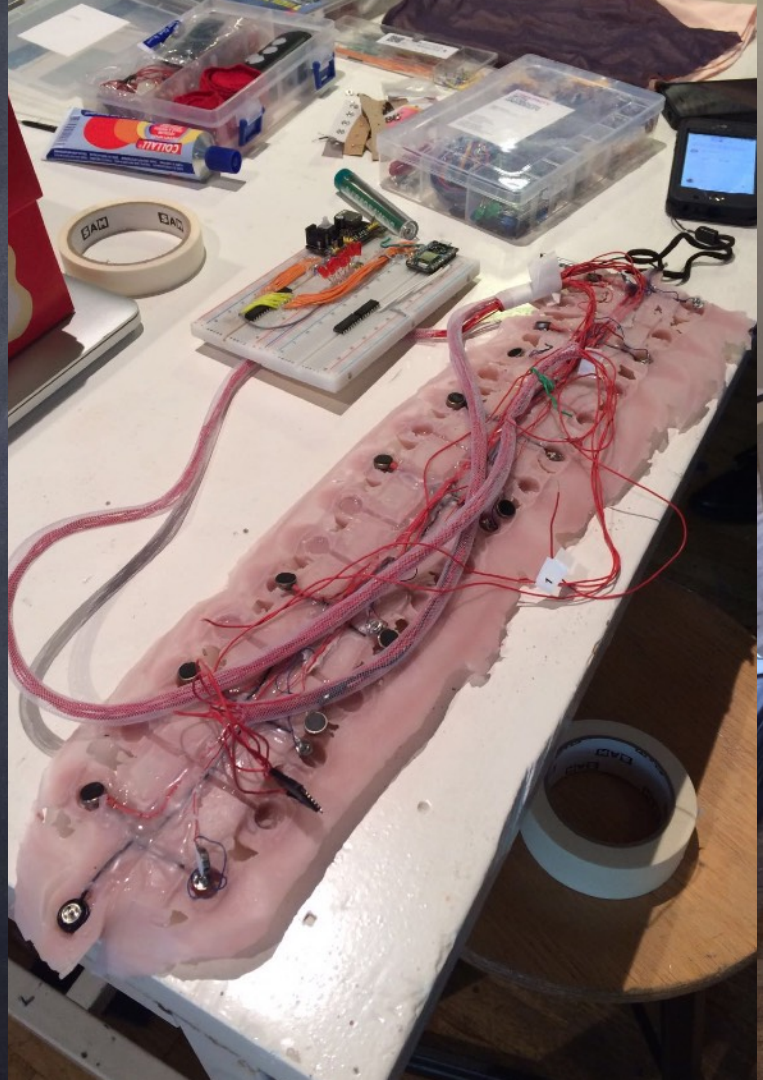
DIEGO S. MARANAN
DSMARANAN@UP.EDU.PH
WWW.SEADS.NETWORK

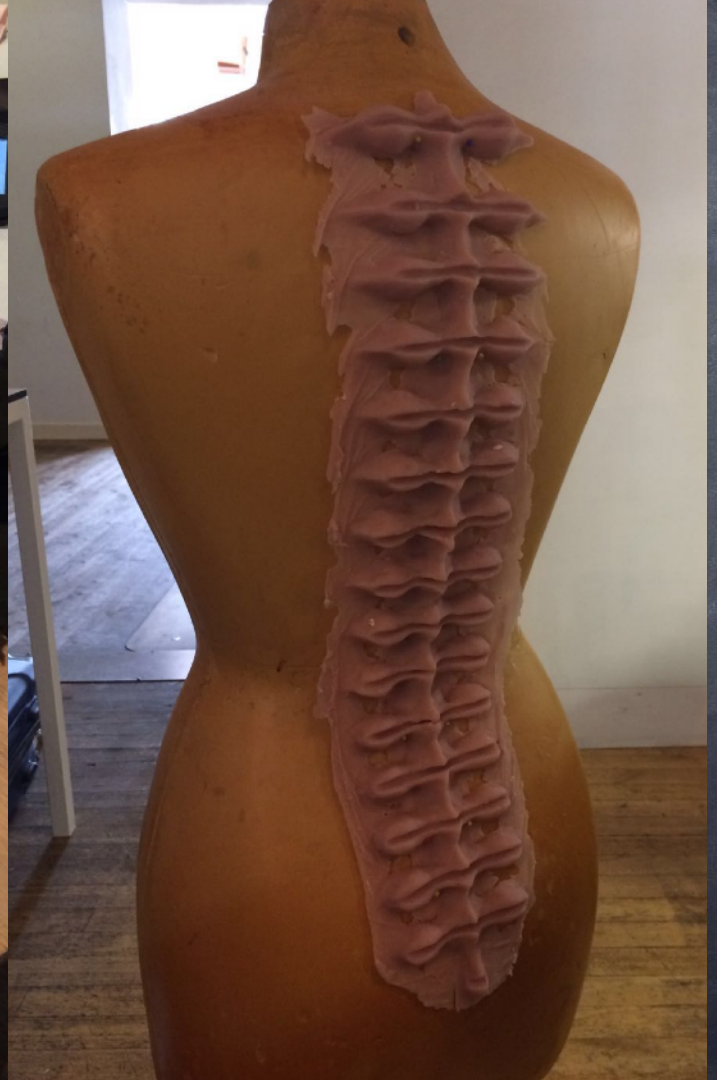
P27*

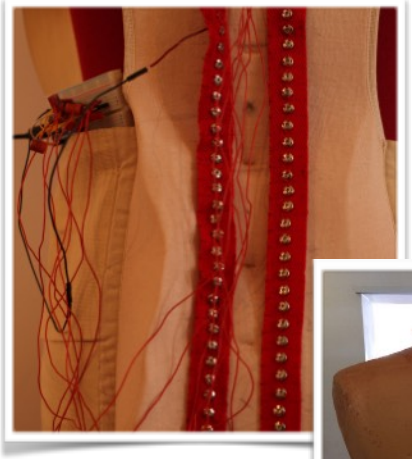


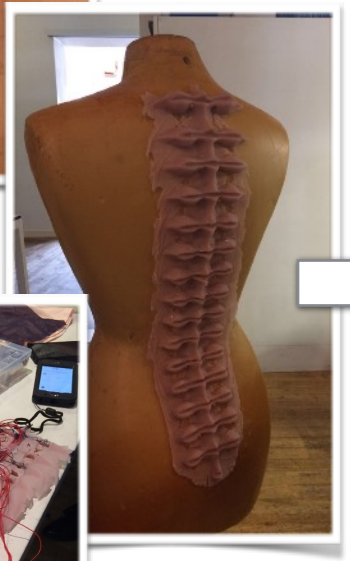


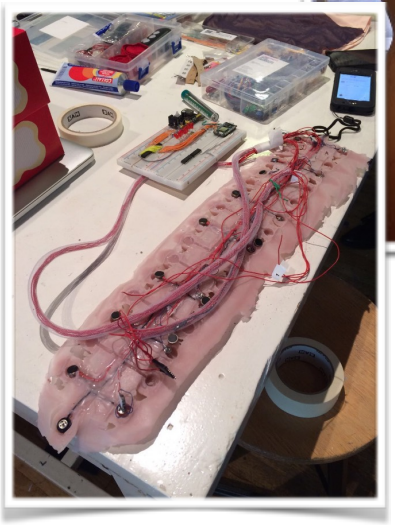
2016-06-26

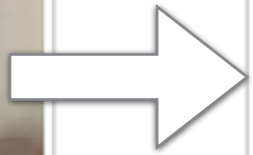












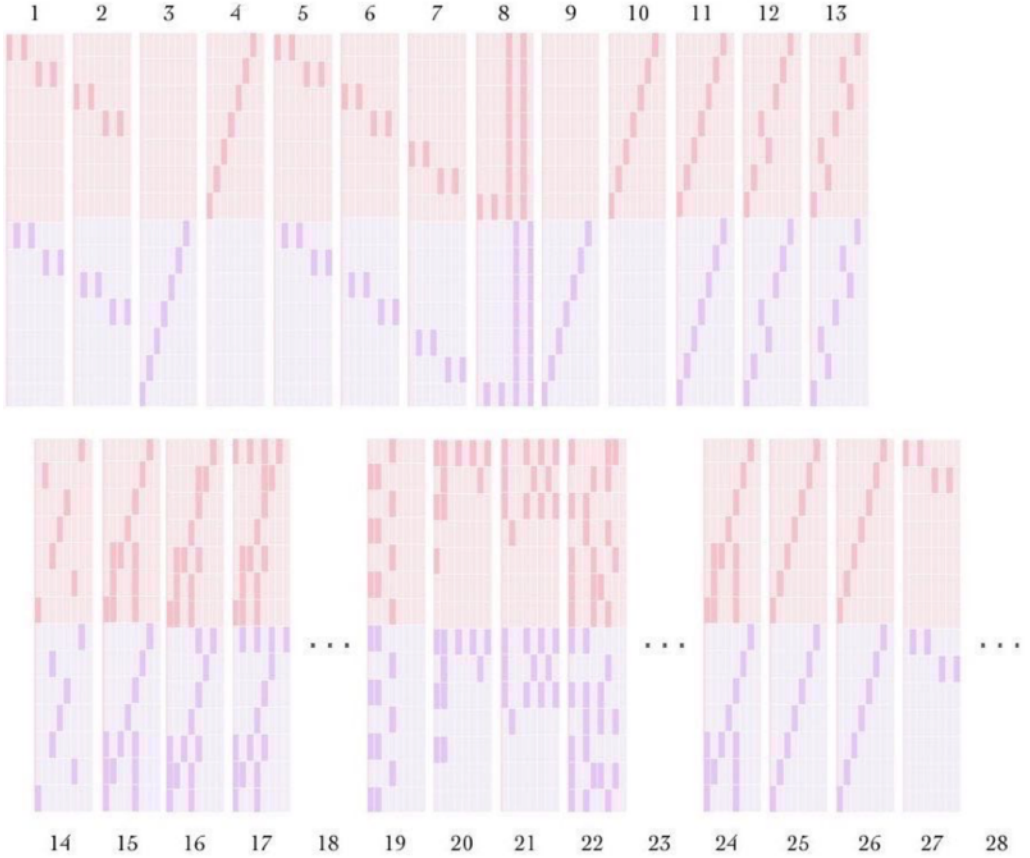
2016-06-28

Individualised neuroadaptive therapies

Elaborated Intrusion Theory of Desire

Kavanagh, D. J., Andrade, J., & May, J. (2005). Imaginary Relish and Exquisite Torture: The Elaborated Intrusion Theory of Desire. Psychological Review, 112(2), 446–467.

Haplós for food cravings



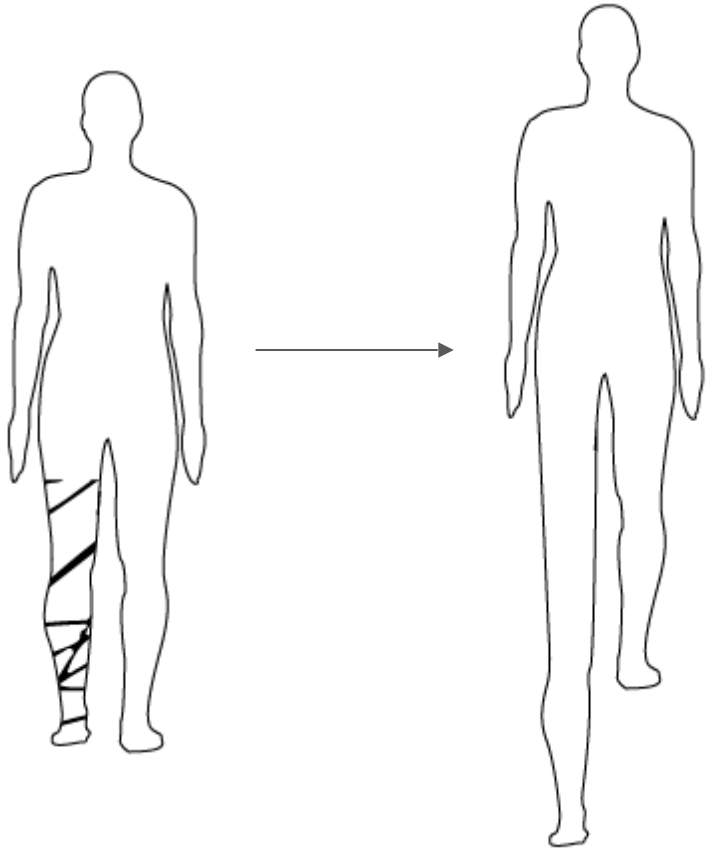
- Randomised control trial, n = 60
- Cravings Experience Questionnaire (CEQ)
- Significant results between the experimental group and the control group for the CEQ frequency scores, $t = 2.12 (df = 46)$, $p = 0.039$, with the experimental group having an average craving of 2.07 and the control group having an average craving of 3.074, suggesting that those who wore the body vest with the motors in experienced a lower frequency of chocolate cravings

the disconnected self

not feeling whole

not feeling comfortable with sensing your own body

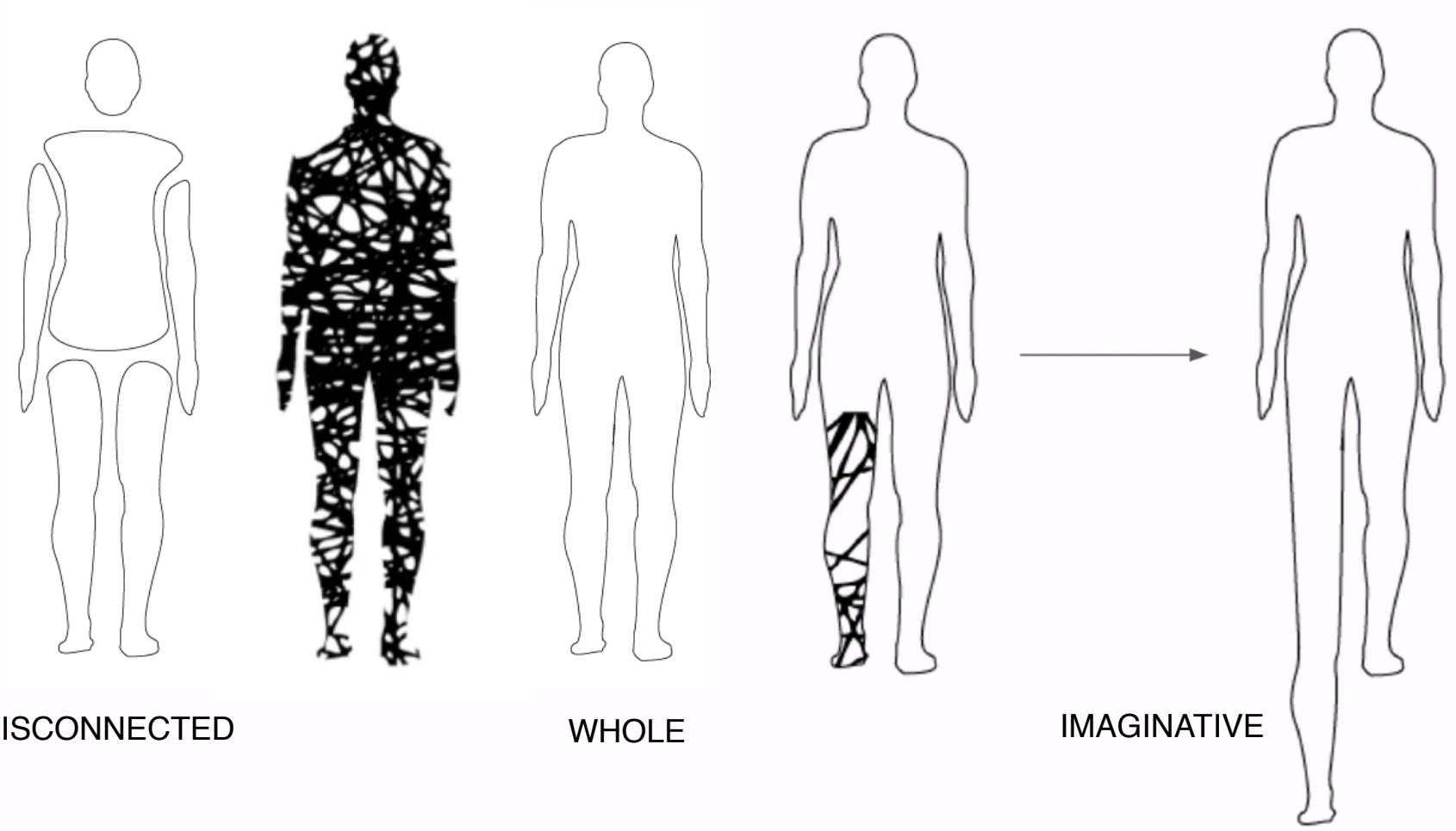
in the extreme: disorders like body dysmorphia, depersonalization



RE/ME

changes the perception of the size and shape of one's body

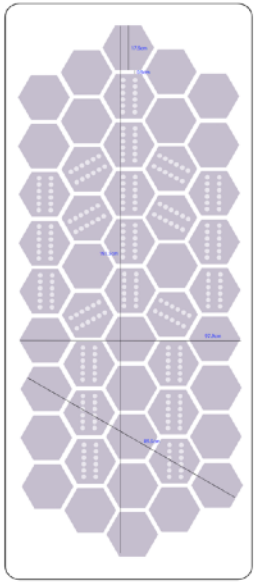
Maranan, D. S. (2017). *Haplós: Towards Technologies for and Applications of Somaesthetics* (PhD thesis). Plymouth University, UK.

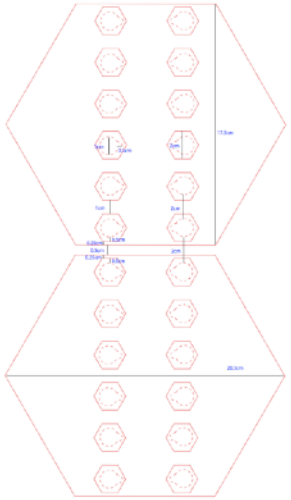


DISCONNECTED

WHOLE

IMAGINATIVE





RE/ME
studies:
SF Public

Takeaways

● Haplos and RE/ME *patterns as aid* for enhancing self-monitoring and proprioceptive/motor awareness (just as Feldenkrais Method is). Still requires patient to attend to movement. Recognition of differences. Creating movement choices, creating awareness of movement po

● Haplos and RE/ME *vibrations as stimulus* similar to (but more targeted than and less invasive (?) than) TENS

● Subtlety matters; First-person approaches matter

● Somatic approaches (e.g., Feldenkrais Method) as a potential intervention. Hillier and Worley (2015): “FM works on a learning paradigm rather than disease-based mechanisms. Further research is required; however, in the meantime, clinicians and professionals may promote the use of FM in populations interested in efficient physical performance and self-efficacy.”

Body awareness
Musical/aesthetic/sensory pleasure
Neuroadaptive possibilities
Intrusive thoughts
Sleep aid
Stroke rehabilitation
Fine motor skill improvement
Hemineglect
Phantom limb
Meditation, mindfulness
Chronic pain
Communication/alarms
Remote presence

THANK/YOU

- The Feldenkrais Method™
- Sally Dean's Somatic Costumes™
- Shusterman's somaesthetics
- **Designing for bodily experience**
- Effects of vibrotactile stimuli on somatosensory cortical representations

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