ECHIDNA

A FINAL DOCUMENTATION

introduction • ideation • precedents • prototype • interaction • final artifact •

designed by

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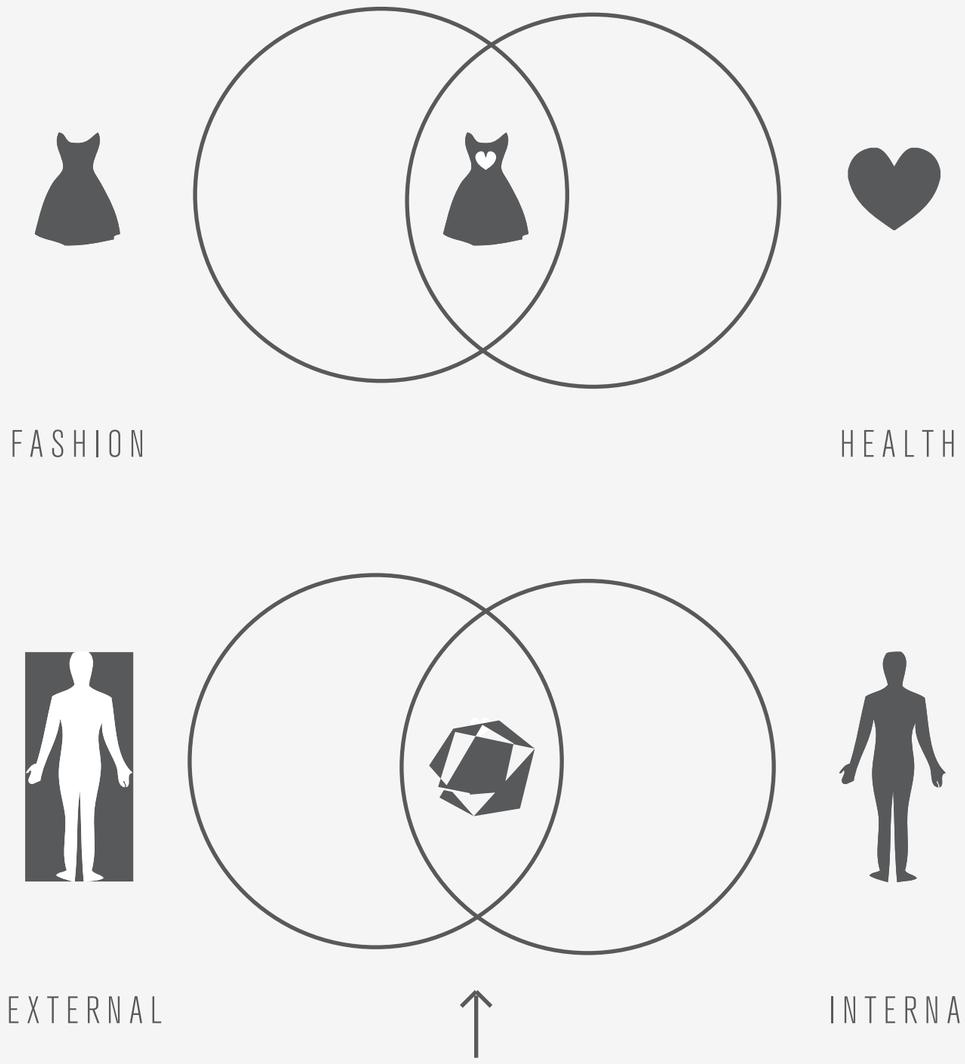
ECHIDNA becomes an **extension** of the physical body by acting in correspondence with the wearer's bodily tension, anxiety, and stress levels. The leaf-like appendages engage and become inert, acting as visual metaphor of the body's internal automatic nervous system as a defense mechanism under states of stress. It aims to visualize **changeability** between opposite states of mind.

THE IDEATION PROCESS



COUPLING EMOTION AND PHYSIOLOGICAL RESPONSE

the body is an extension of the mind.

discovery process

Our initial idea was to integrate both fashion and health into our final product. We compared health, being characteristic of possessing more internal properties, with something of an exterior entity such as fashion. The result was a desire to create a product that would bridge the gap between internal and external via extending the mind through body.

EMBODIMENT ataraxia

an Epicurean philosophy;
a state of tranquility leading
to a freedom from fear

The flux between levels of the mental state.

We aimed to create a metaphor for the *absence and pursuit of ataxaria*
by visualizing *changeability* between opposite states of mind.

Discovery led to the first stages of ECHIDNA.

Our interactive garment is named after the mammalian echidna, which resembles a hedgehog. We have abstracted the spikes, a defensive mechanism of the echidna, and implemented it into our garment as a visual metaphor of the body's internal automatic system as a defense mechanism under states of stress.

Our initial sketch.

ECHIDNA
in a *tranquil* state:
Spikes are down
and inert.

ECHIDNA
in an *aroused* state:
Spikes are upright
and engaged.

PRECEDENT incertitudes

Designed by Ying Gau, *Incertitudes* consists of two interactive garments built around the idea of incertainty. The garments are voice activated, generating the pins to contract and expand.

PRECEDENT smart second skin dress

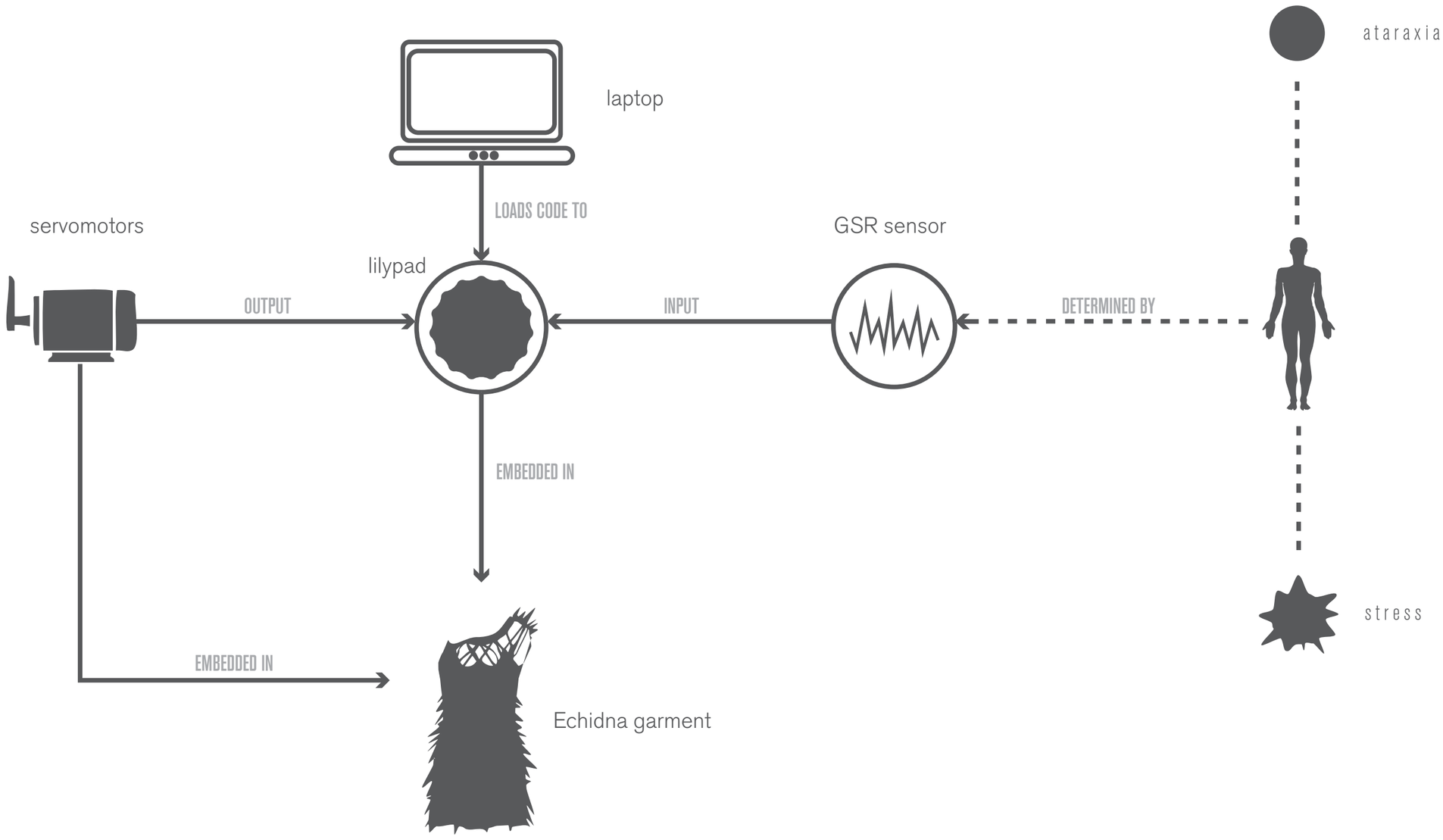
Jenny Tillotson explores the sense of smell in an individual's emotional life. The dress reacts on the bodily functions of the wearer through embedded sensors that detect various moods to omit a suitable corresponding fragrance.

IDEATION RESEARCH PROTOTYPE PRODUCT

THE PROTOTYPE PROCESS

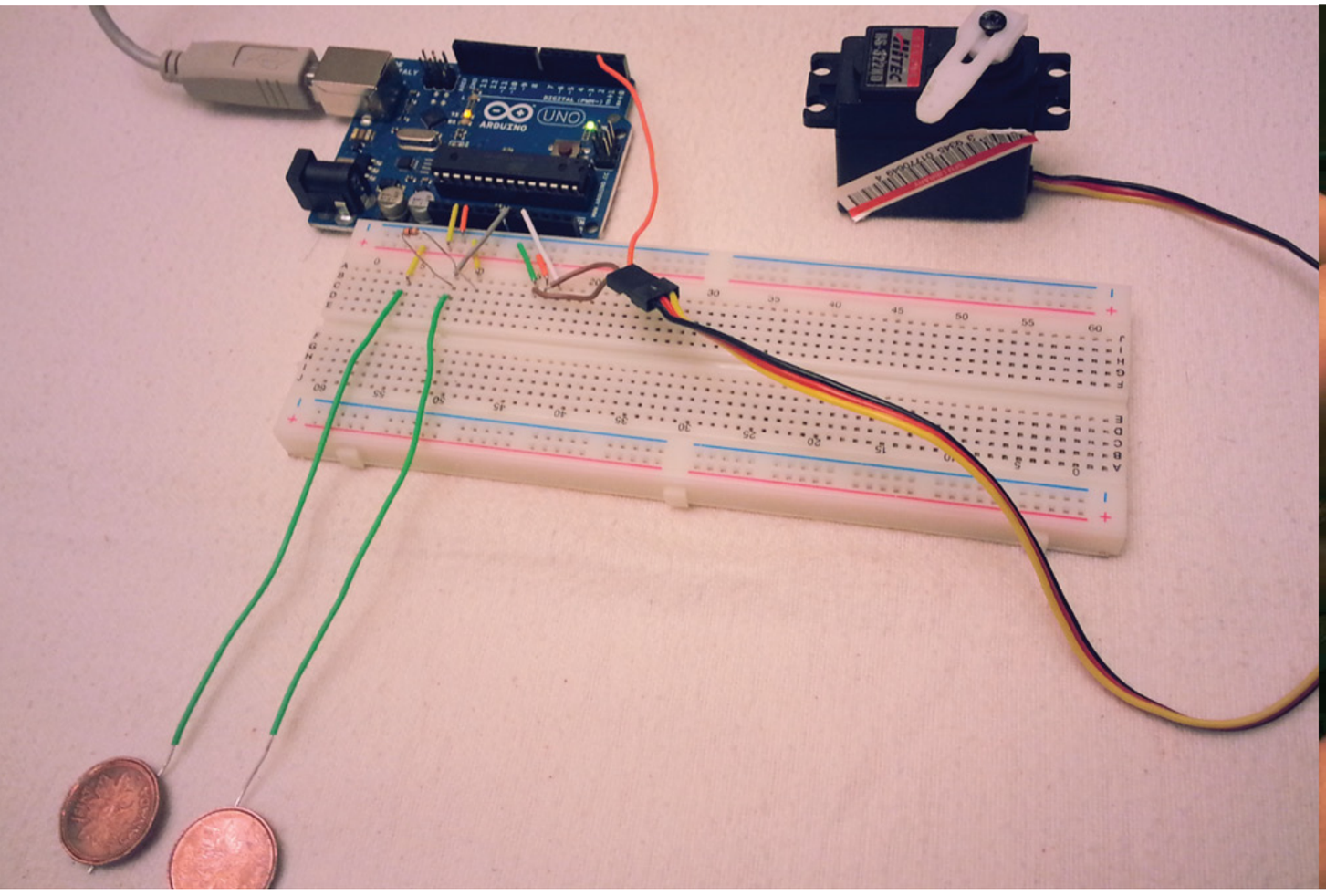
STRUCTURE

After much experimentation with what actuators and sensors we could use to trigger the movement of the spikes, we settled on using a homemade GSR and a servomotor. At this point however, we also had a nanomuscle actuator and nitinol memory shape wires as a back up if needed through the trial and error processes.

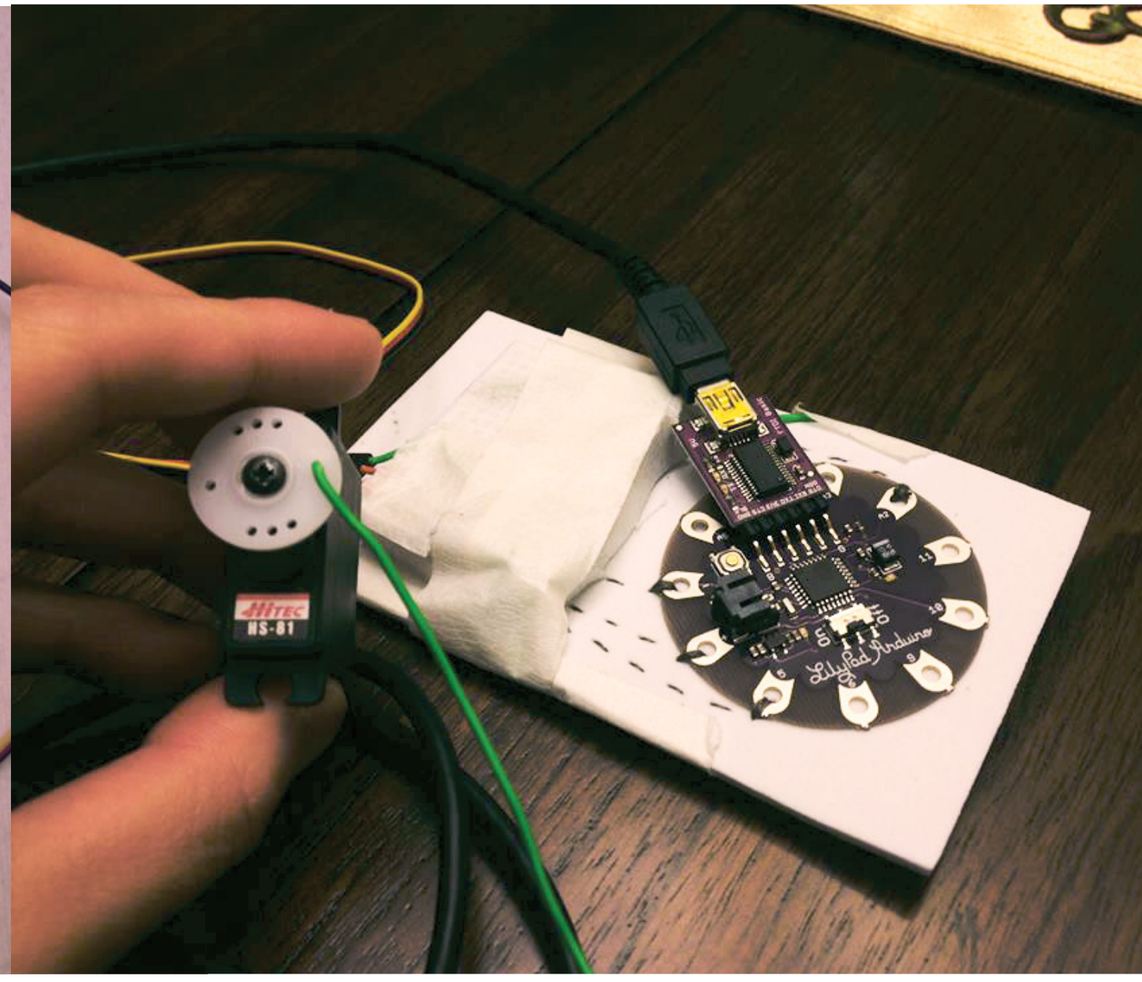


the PROTOTYPE

Our prototype was in the stage of its very naked skeletal form. We wanted to perfect our code and have our actuators to work in a desired manner before implementing it onto our garment.



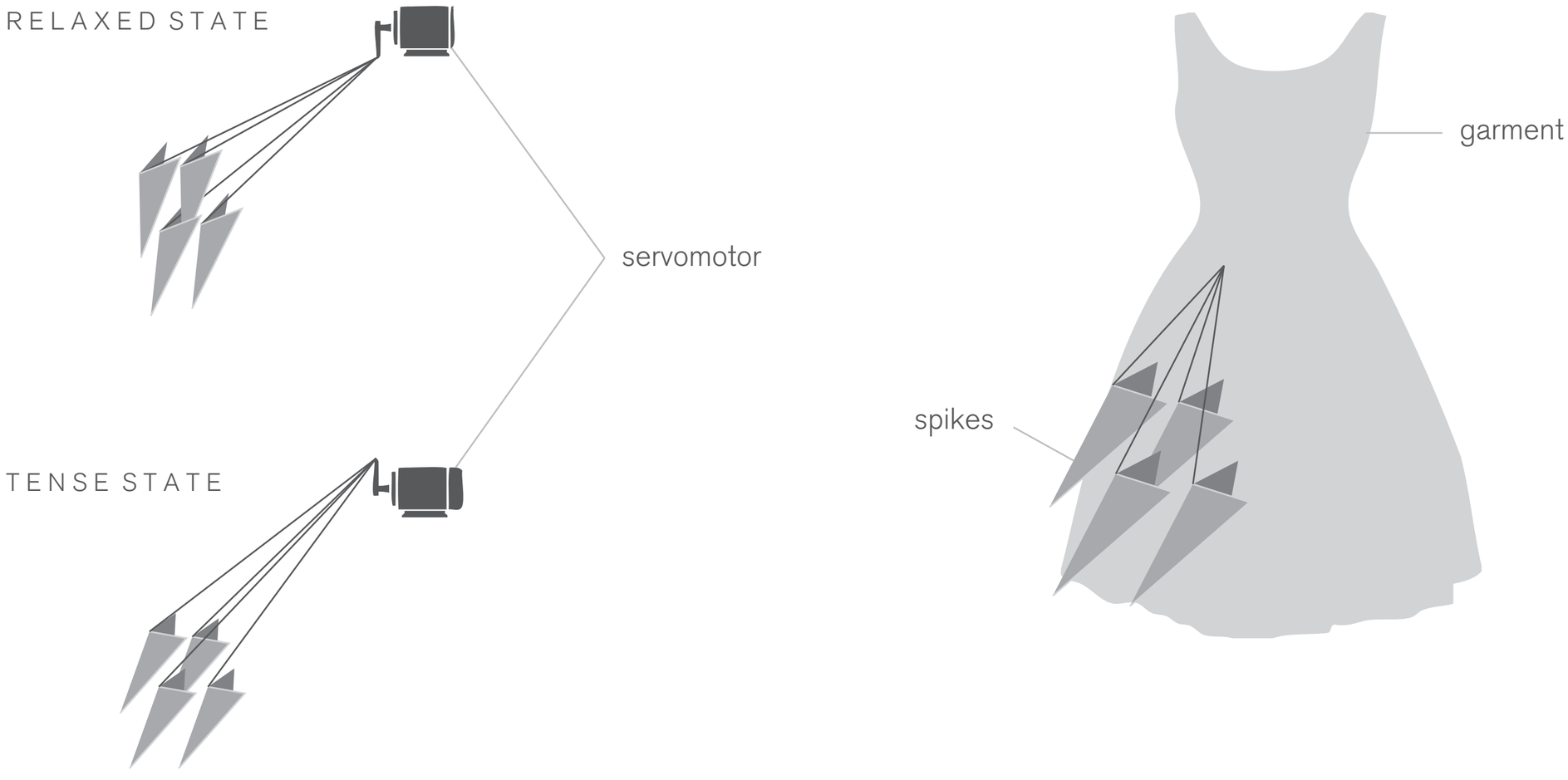
Initial prototype: a basic circuit with arduino uno, a servo, and a homemade gsr sensor with pennies.

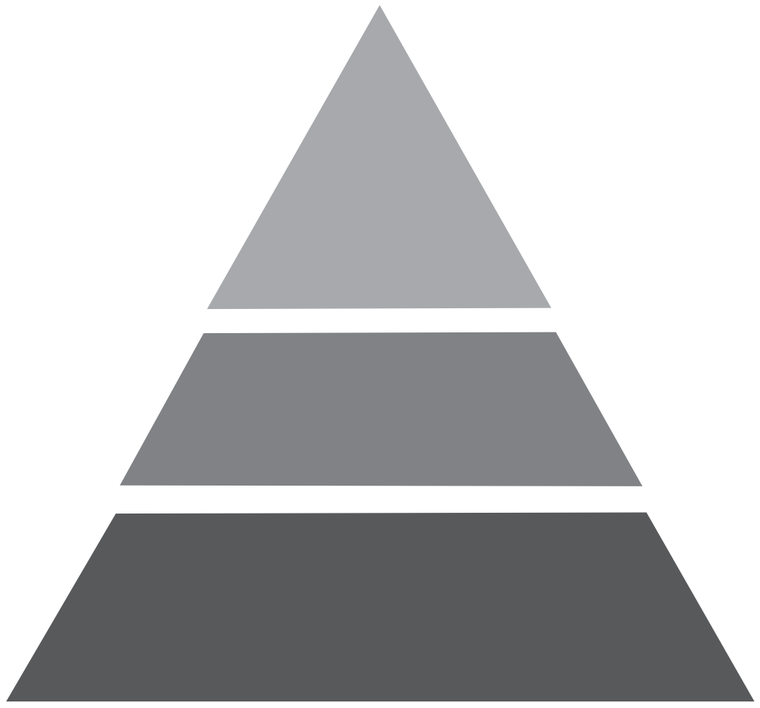


Secondary prototype: lilypad arduino embedded onto craft foam, while using conductive thread for the circuit's connections. With medical tape, the circuit and the gsr would be secured directly on the user.

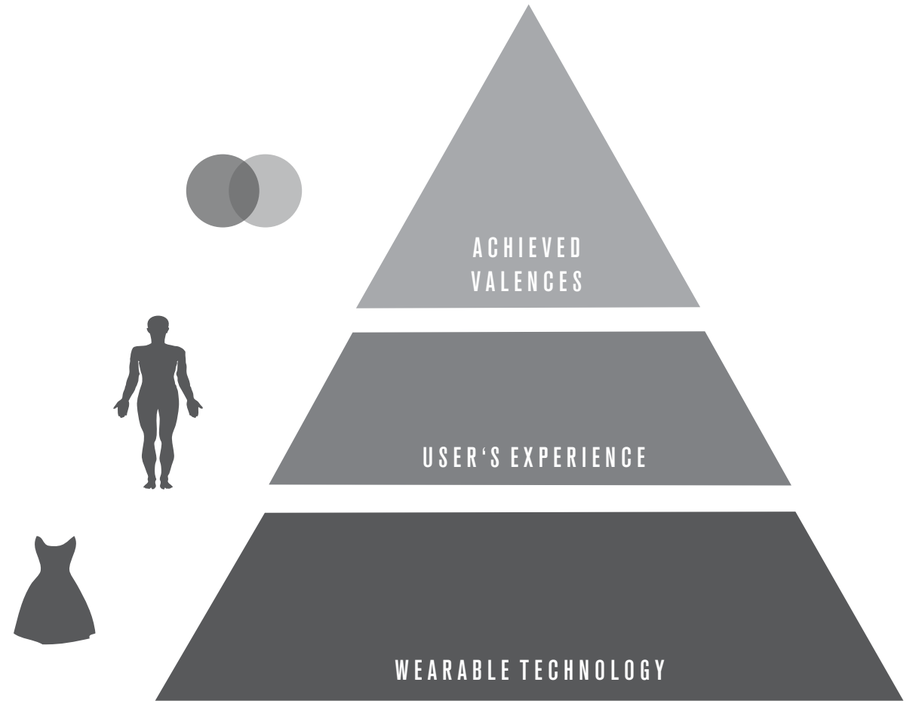
the PROTOTYPE

The servomotors act as a device that will raise a number of spikes through a pulley-like mechanism. At this stage, we were still experimenting with specific materials, as well as exploring ways this mechanism would be embedded into our garment.





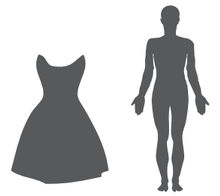
THE INTERACTION



Interactions involved in Echidna build on one another. The technology used for the dress will ultimately achieve a response from the user, who will adopt a valence in accordance to the event or situation.

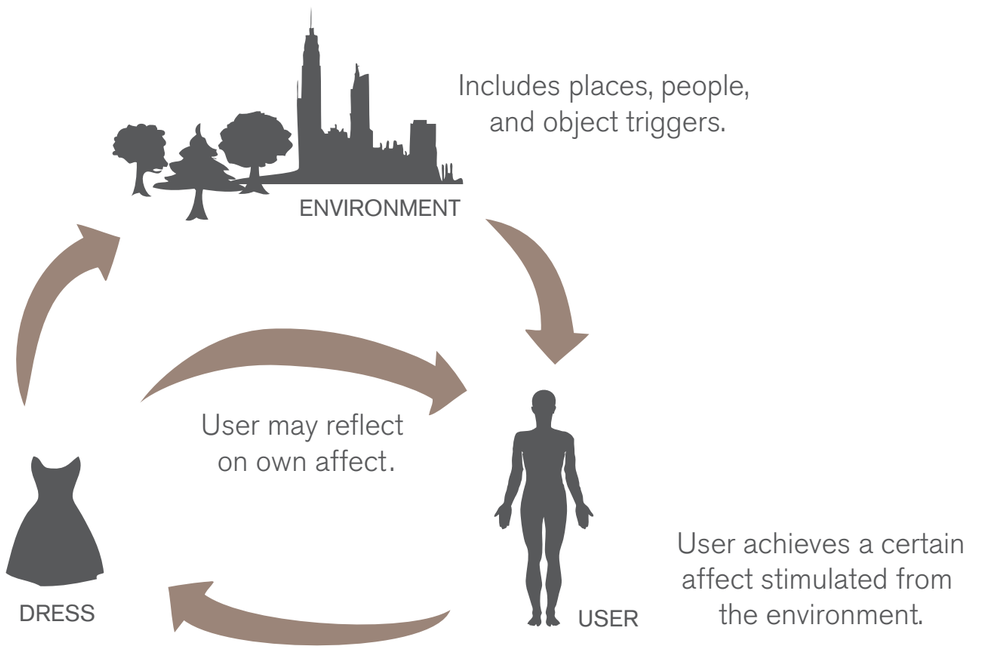
ELEMENTS OF AFFECTIVE QUALITY.

Objects, places, and events have an AQ.



The wearable has an AQ on the user and people around it.

INTERACTION ACHIEVES AFFECT.



THE FINAL ARTIFACT

the final AESTHETICS

Our final garment pursues a minimal theme of white, as we were aiming to achieve a simple and clean aesthetic that would not distract from the functional centrepiece of our project. The primary dress base is made up of white twill fabric and sheer organza. We crafted the ‘spikes’ to take on a leaf-like form, as it better suited the aesthetic look of mobilizing into the engaged upright position. These ‘spikes’ were made from craft foam and interfaced with fabric to harmonize with the material of the dress.

finalized

INTERACTION & RESPONSES

Our original design incorportated hidden mechanics which would be embedded on the inner side of the dress. However, rather than concealing the servo and the wires that pulled the spikes upward in our final piece, we were able to integrate the mechanics on the exterior of the garment in an inobstrusive manner. We found that this design decision added further interest to our garment.

The interaction concepts of our garment remained fairly constant throughout our project. The dress responds to the wearer through a galvanic skin response sensor attached to the skin of the wearer underneath the dress. The sensor retrieves values to measure the wearer's stress levels. If the values reach a certain threshold, the 'spikes' engage in an upright position. If this threshold is constantly met, the spikes remain active. Below the threshold, the spikes disengage and become inert.

video

DOCUMENTATION

https://vimeo.com/81870464

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THANKS FOR VIEWING.

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