plié

plié

Communicating Bodies

Sara Hassoune
Supervision - Mika Satomi
weißensee kunsthochschule berlin
WS 2021/22, BA 7. Semester

concept

plié *french, adjective /*

past participle, masculine

folded
bent/ bended
collapsed

from

plier *verb*

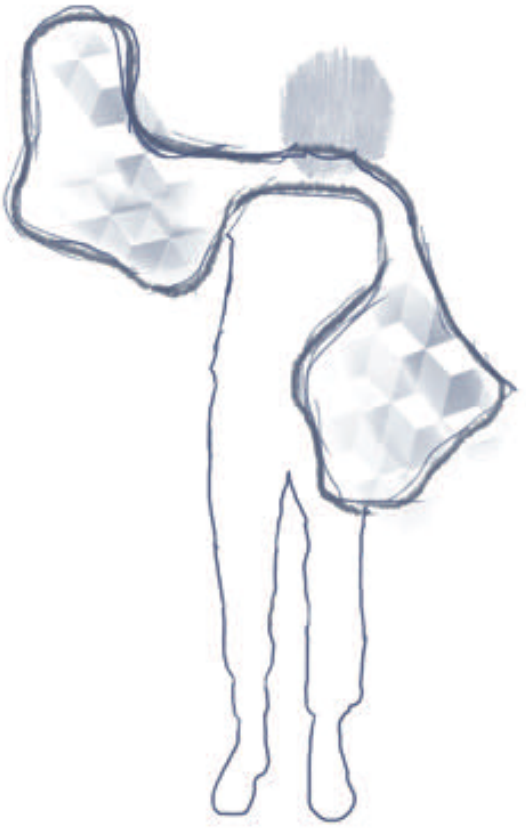
to fold
to bend

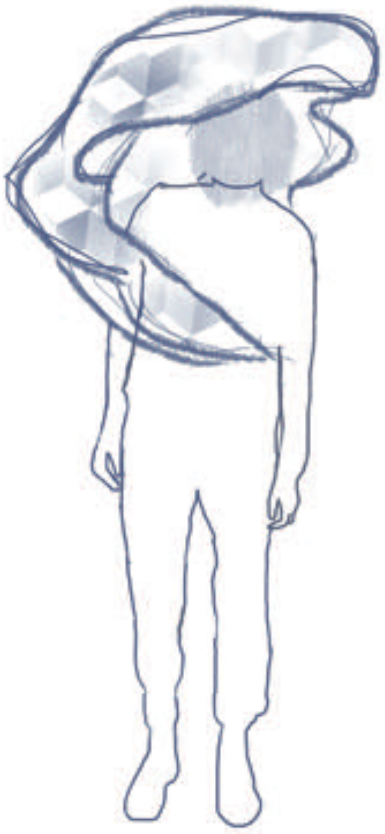
Folding is natures most common way of making
patterns. It can occur in all matters and materials.
A simple fold contains a range of dynamics and depths.
They are a direct result of movement which in return means
that movement can be detected by
monitoring or ‘‘reading‘‘ folds.

What if we use this result of movement (folds) as the actual
means to explore and express the body and its relationship
to the surrounding environment?

What happens if we add an
additional element like sound to further intensify the
experience?

Similarly to the fold, sound can be used as a sort of
auditory visualizer of the moving body.
A voice for the body.
An embodied voice.





In this project, paper origami techniques are used to pleat fabric to create three-dimensional wearable sculptures that work as sort of an extensions of the body. Textile sensors, which respond to movement by reading a change in resistance when opening and closing the folds, are added to trigger selected sounds. This allows the wearer to experience something very familiar - their body - in a new, different way. They become much more conscious of their body, its movements and the space they hold in a room. Usually, when e.g. dancing, the moves are clear reactions to the music. But with the pleated sensor the two seem to merge. Does the wearer control the sound? Or does the sound influence the wearers motions? Is it a combination of both?

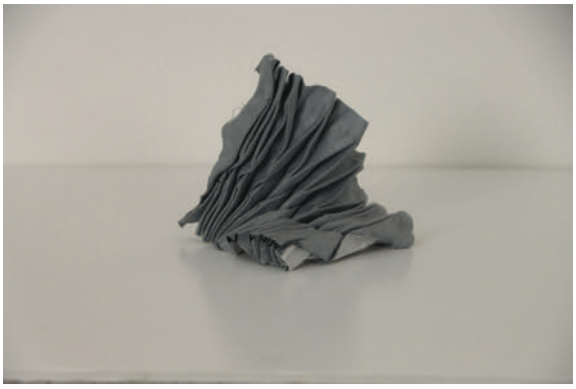
The origami pleated sensor - in combination with selected sounds and the body‘s movement - creates very individual multi-facetted & multi-sensory explorations of nonverbal, embodied communication.

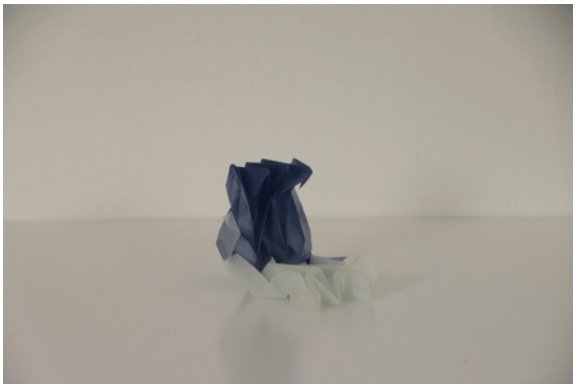
process

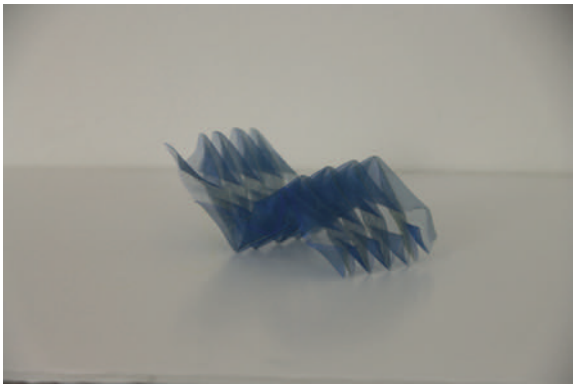
For the prototype it was decided to create a sleeve-like wearable sensor that would allow for a lot of big, free body movement and therefore a big range for opening and closing the folds.
Through a long process of trying out different origami patterns and folding countless small paper mock-ups, the shape for the sleeve was found - a tube-like spiral made by using origami herringbone tessellation. The tube is fully collapsable, fits an arm inside and can be attached to the shoulder.

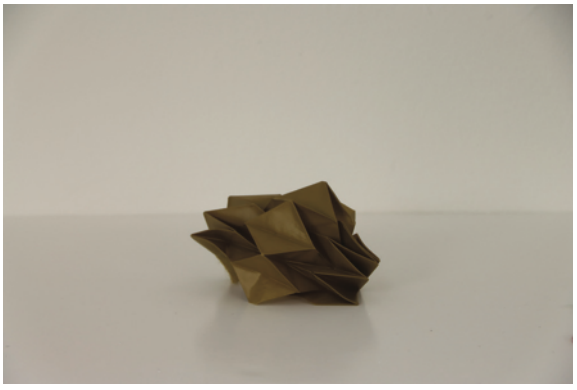
Trying out different fabrics, there was a quick obvious realization, that synthetic fabric would work the best for the pleating.
For the sensor part of the sleeve the ideal was to have something super light, almost weightless, that wouldn't interrupt or change the way the fabric and the folds move. The first tries were made with conductive paint, which turned out to peel right off the synthetic fabric when dry. What ended up being used was graphite spray paint that allowed for a very thin conductive & resistive coat.

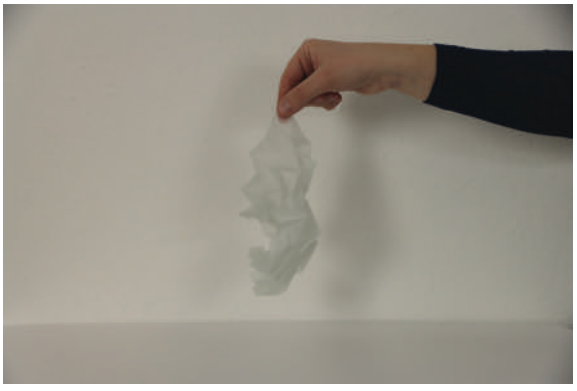
After exploring different qualities and properties, a very lightweight but super dense fabric made up of 100 % Poly-amid was chosen.

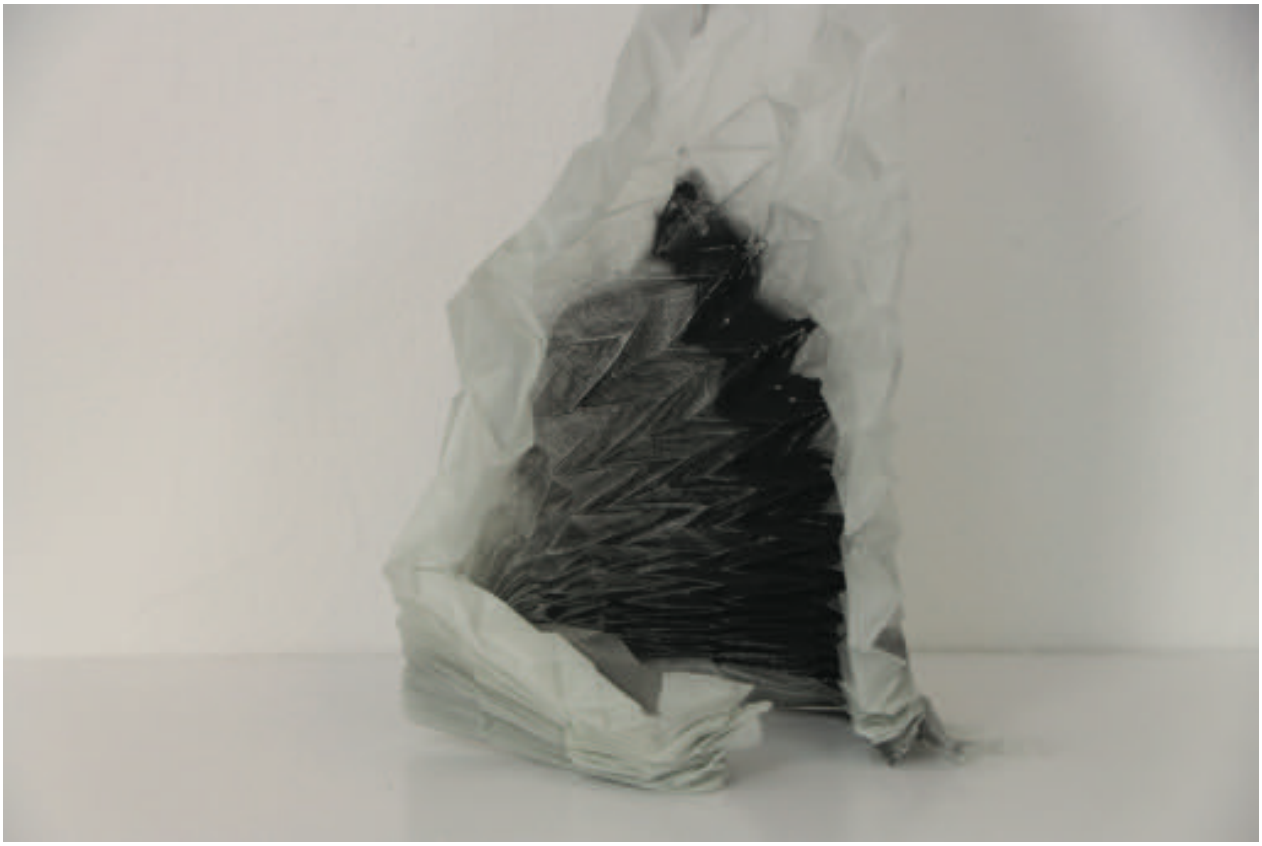




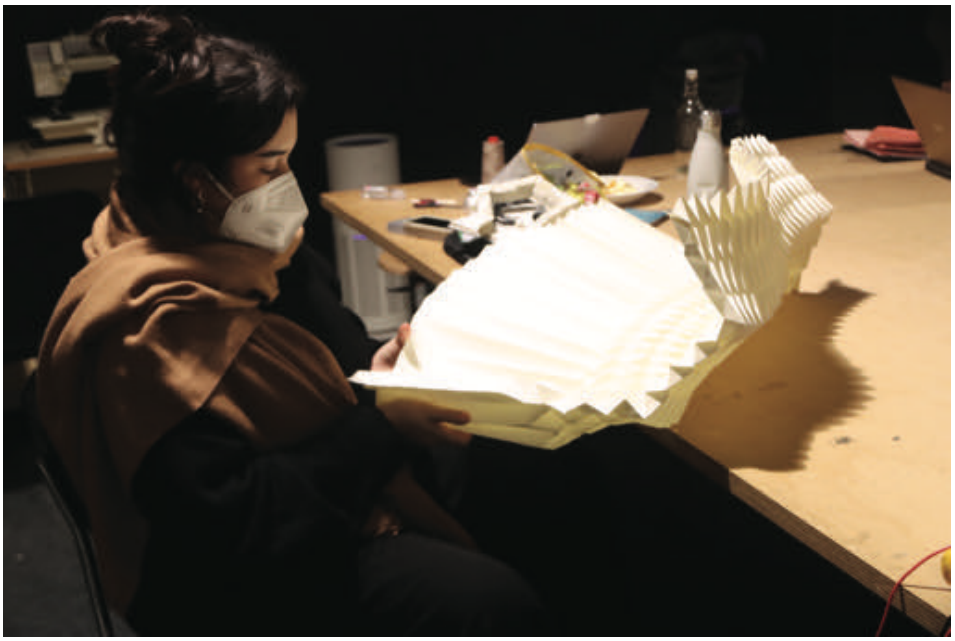


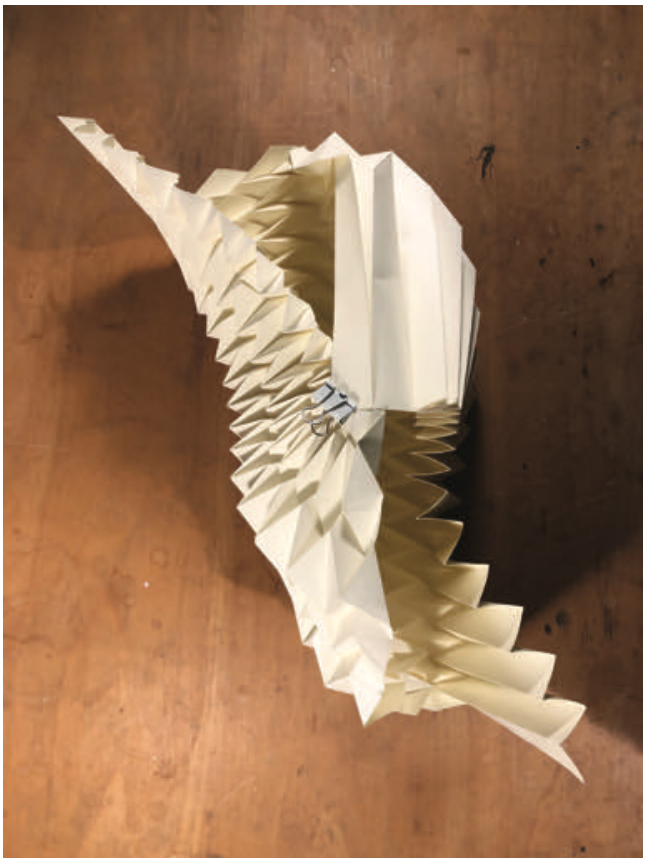


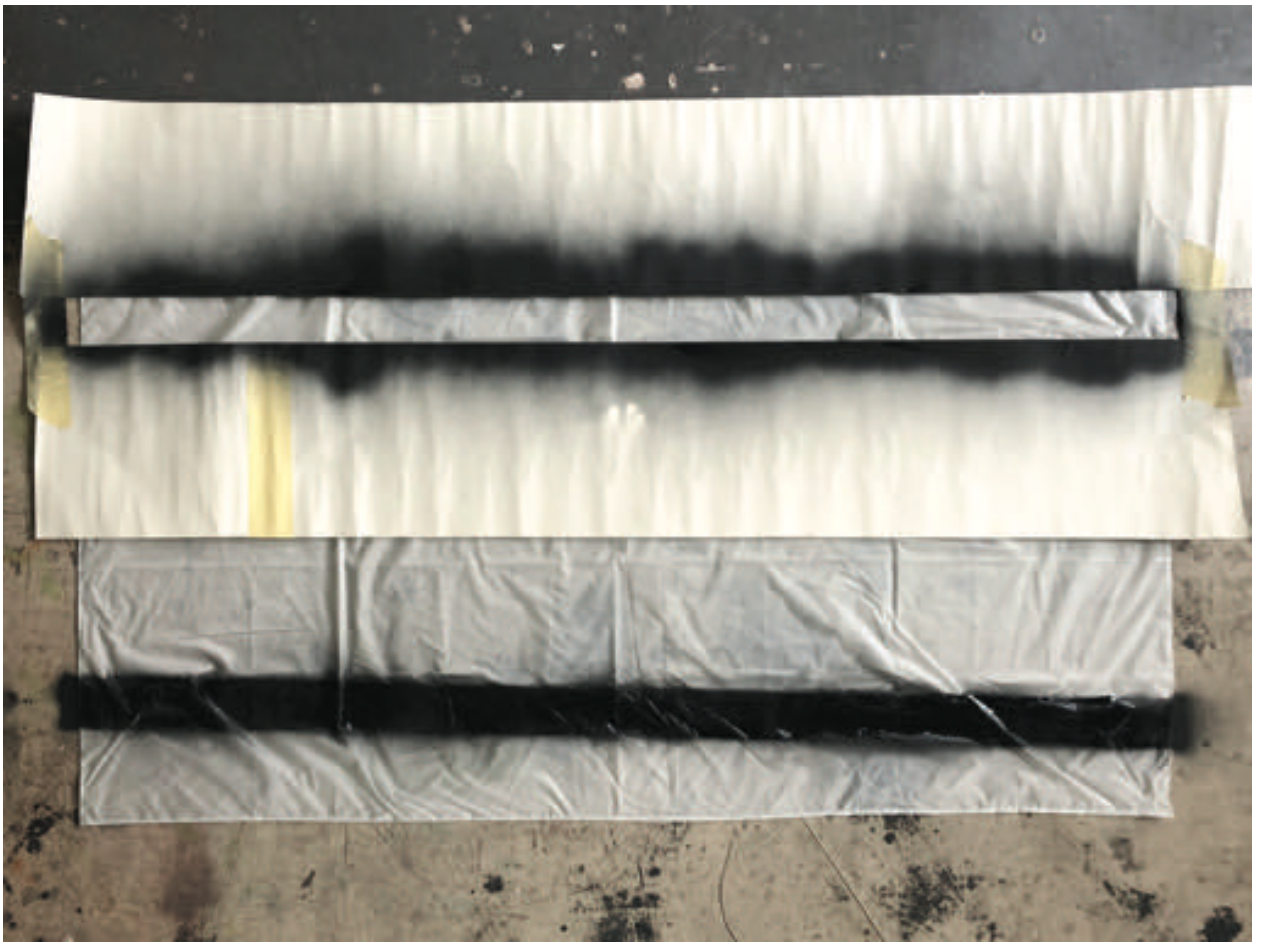


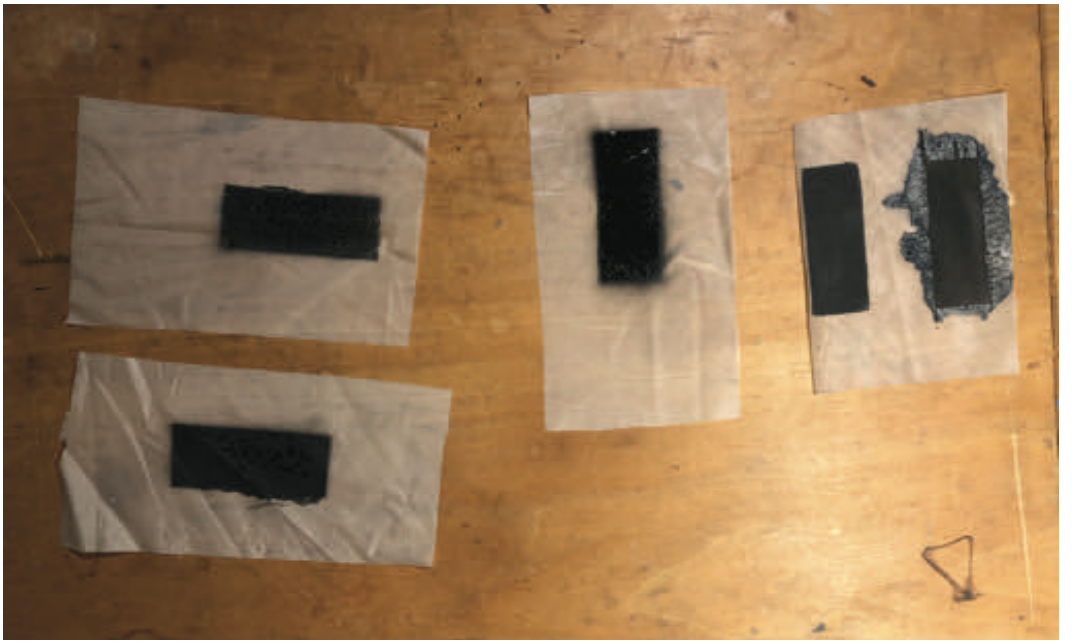


The creation of the pleated sensor involves five steps.
First - folding two identical origami molds out of paper.

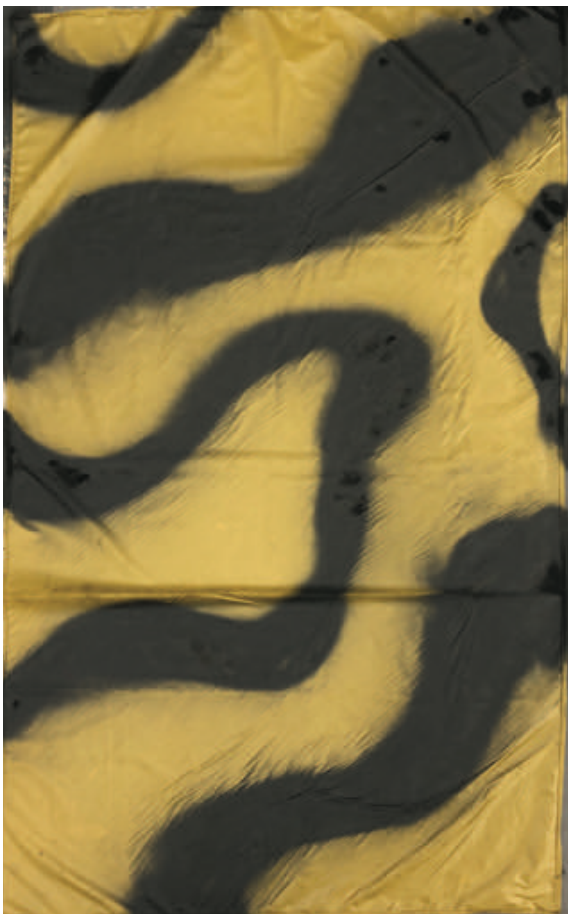




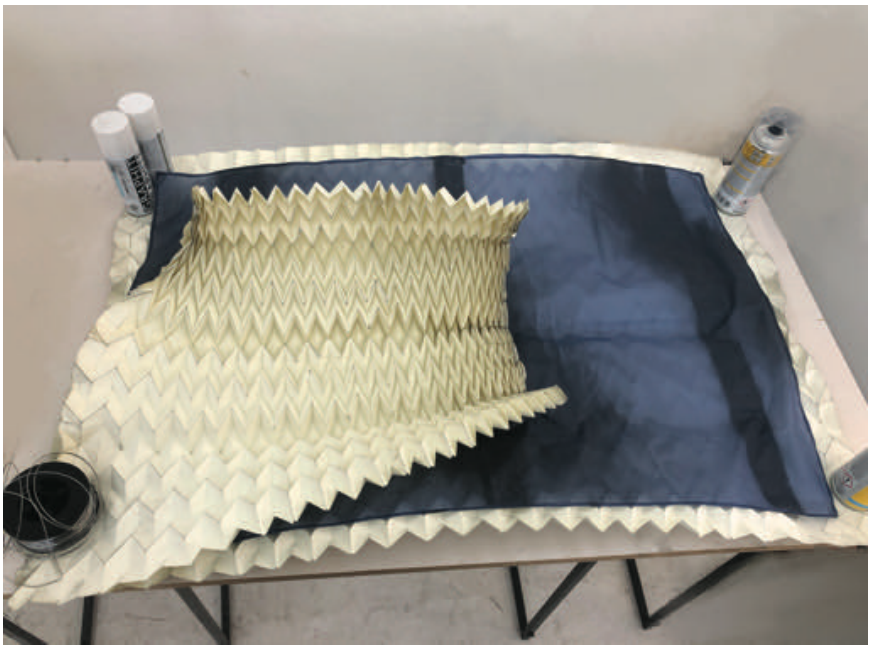




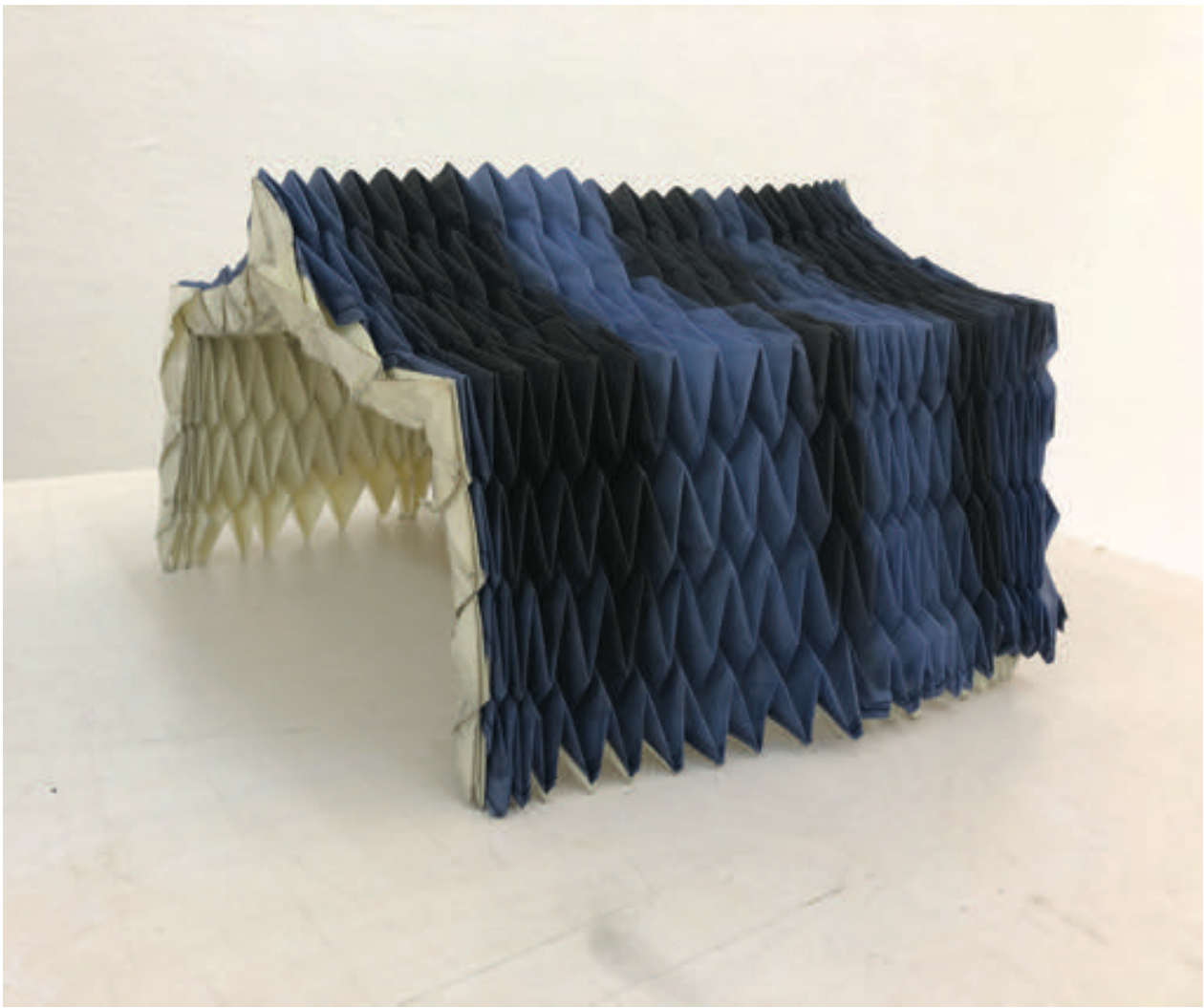
After cutting the fabric, the graphite spray paint is applied either using stencils for a structured/geometric result, or freehand for a more organic one.



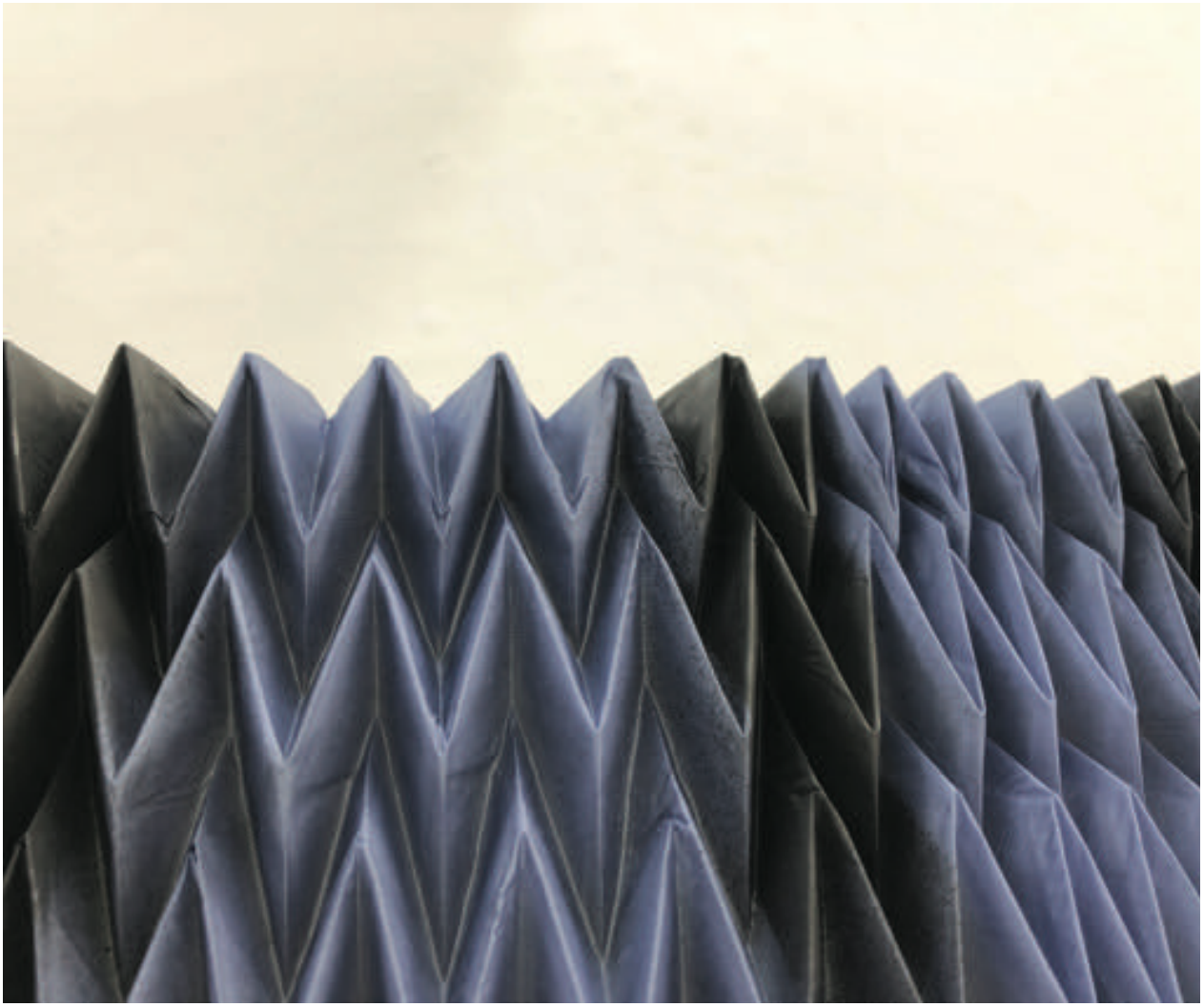
When dry, the fabric is sandwiched between the two paper molds by using weights and applying pressure when collapsing the molds so that everything fits as tight as possible and securing it with string or rubber bands.

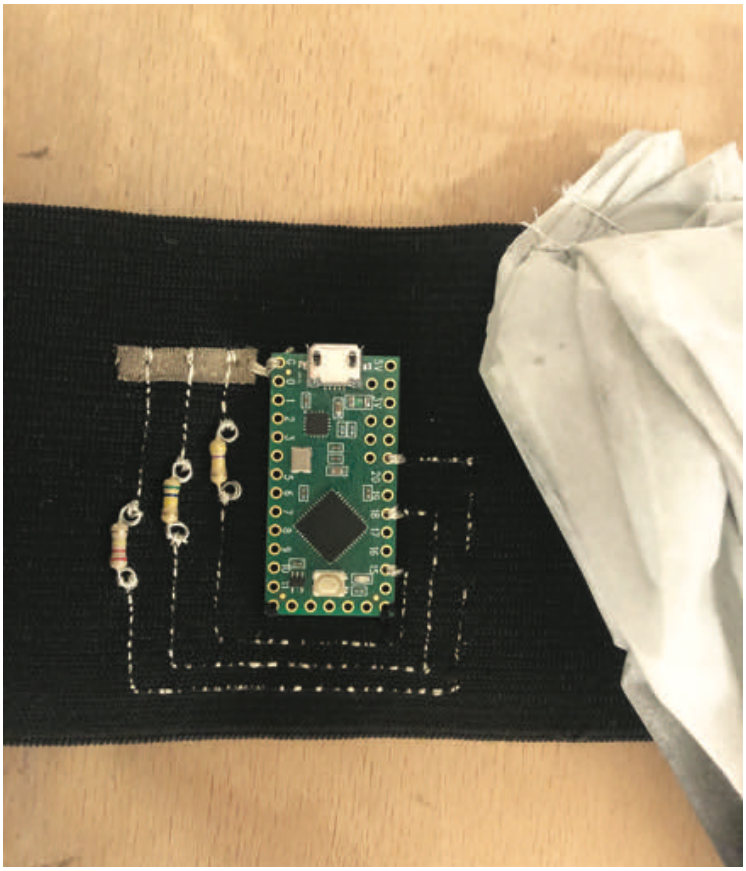


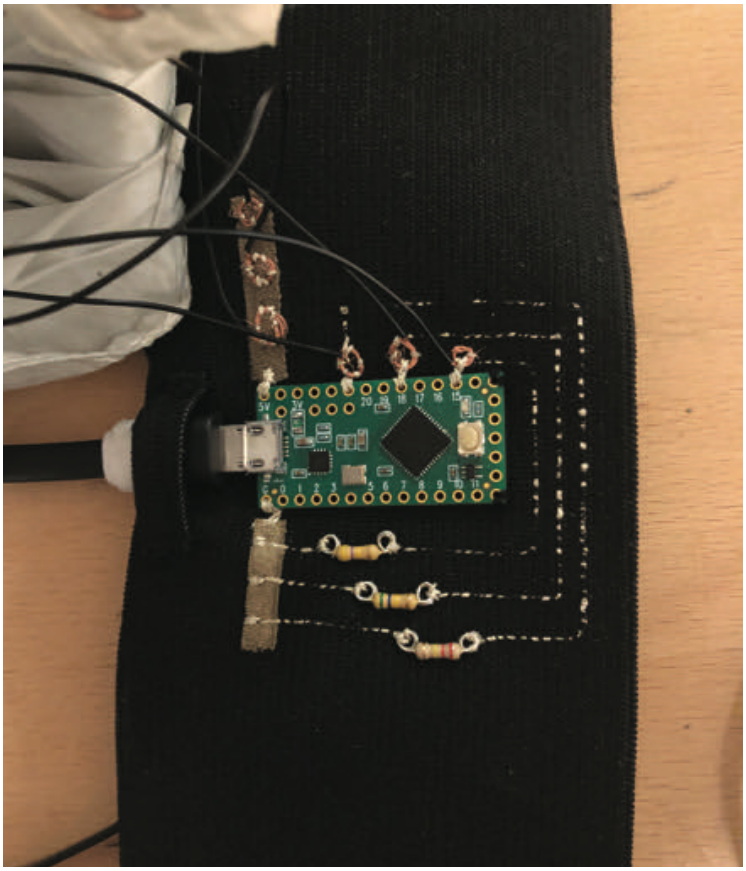
To set the pleats into the fabric, heat is needed. A simple iron with a steam setting was used. This allowed for good control over the temperature and amount of steam, as too much will melt the synthetic fabric.



Let the closed mold cool down completely. For the bigger samples and the final prototype some kind of reinforcement was needed to keep the folds as stiff and clean as possible. Here, a clear spray lacquer was applied after opening and removing one side of the mold.







As the fabric was supposed to be kept as light as possible, all the wiring and hardware was put onto a broad elastic, which also functioned as strap to fix the pleated fabric to the upper arm. The connection to the individual sensors was made with isolated wires. To transmit all the data to a computer via cable, a microcontroller (in this case it is the “Teensy LC”) is sown onto the elastic band with conductive silver yarn. With the help of the program “PD”, all the collected data can now be tracked and translated into sound by reading the change in resistance of the graphite paint when the fabric and folds are being moved.

results

Wearing the prototype, even from the start when putting it on there is a lot of caution and care when it comes to touching the fabric in fear of “destroying” the pleats. At first the movements are hesitant, small. In addition to that, one becomes sort of hyperaware. The movements are more thought out, careful, testing out the sensor and the sounds that result directly in ones own movements. Whilst the folds are obviously predetermined and set and therefore their range of motion is limited to just an open - close, the way the fabric spirals around the arms makes it look the opposite of stiff and rigid (as one might expect it to be). The light, flow-y fabric allows the pleated sensor to become an extension of the body. The movements control the sound - the sound sometimes also influences the next movements. Folds, movements, sounds; it all seems to merge into one.

A special Thank You to

DYNTEX®
TEXTILE ACTIVIST

for kindly sponsoring the fabrics!