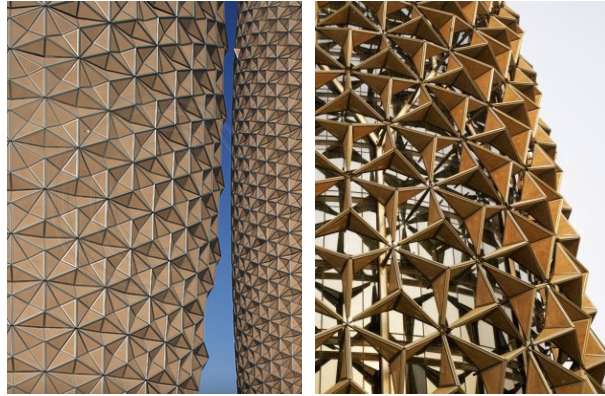


# ADAPTIVE MATERIALS (WITH TIME)

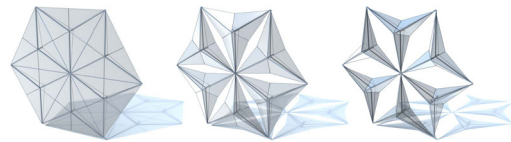
THAO P NGUYEN

## REFERENCES



**The Al Bahar Towers in Abu Dhabi**  
**Aedas**

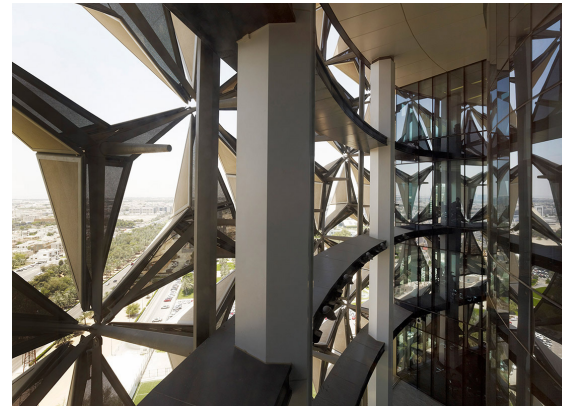
To fight with the heat and wind in the city, the buildings have a kinetic skin which can provide shades for the residents inside. An outer skin is essential for the glass buildings in Abu Dhabi because the harsh sun light that shines though the glass can cause a great greenhouse effect.



The system is computer controlled, based on the sun path of the day. The screen can prevent heat and glare when closed. When it is opened, it looks like mashrabiya, a traditional geometrically-designed lattice screen for windows.



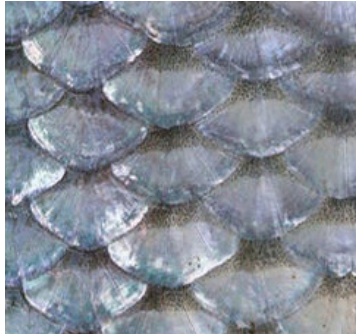
The shade is made of steel and fiber glass coating for each triangle. These materials are light therefore they can allow faster and responsive movement.



# ADAPTIVE MATERIALS (WITH TIME)

THAO P NGUYEN

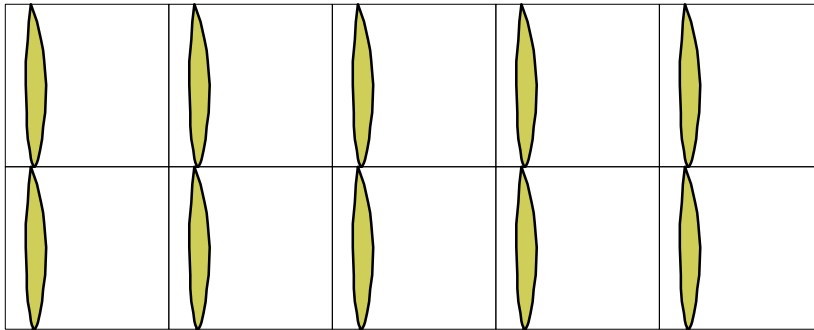
## PROPOSAL



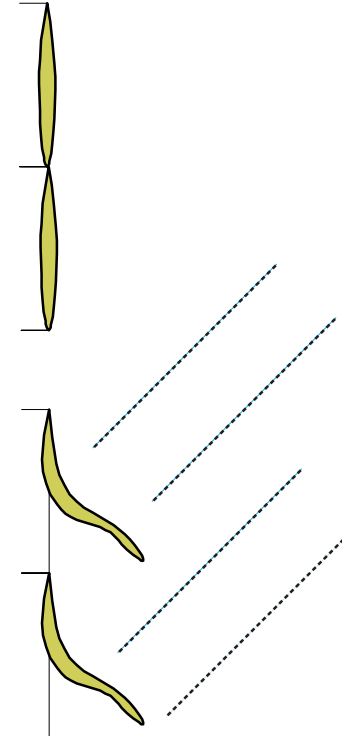
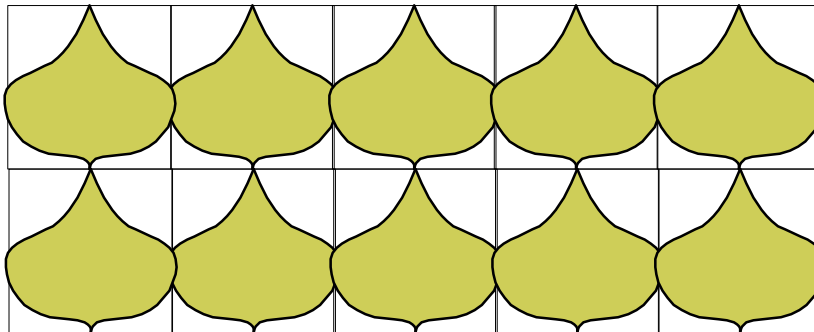
London weather is unpredictable. In general, it is always wet and grey. Sometimes, it can get very sunny and it will rain in a blink of an eye. In my concept, London time depends on the weather. The facade therefore will change due to the weather. I want to create an element based facade that can let the light in when there's no rain and can direct the rain drops outward when there is rain.

I used fish scale as a reference. The structure and arrangement of the each element of the scales suit my proposal's purpose.

The elements close to let the light in



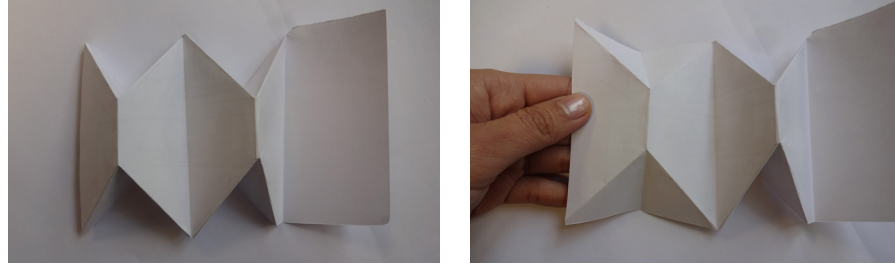
The elements open and tilt to prevent rain



# ADAPTIVE MATERIALS (WITH TIME)

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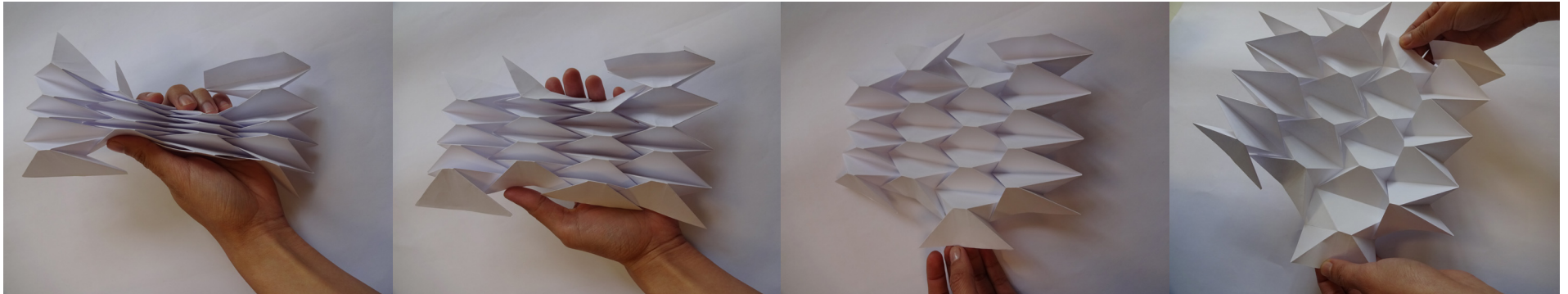
## STRUCTURE FINDING



I first experimented with folding structure and using paper as material



The next step is to change the dimensions of each rectangle element and connecting the elements together



By connecting more elements, I can create a surface which can be folded and when opened, it can create a curve.

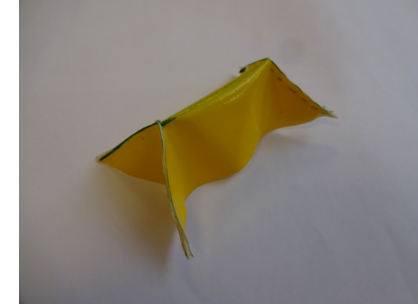
# ADAPTIVE MATERIALS (WITH TIME)

THAO P NGUYEN

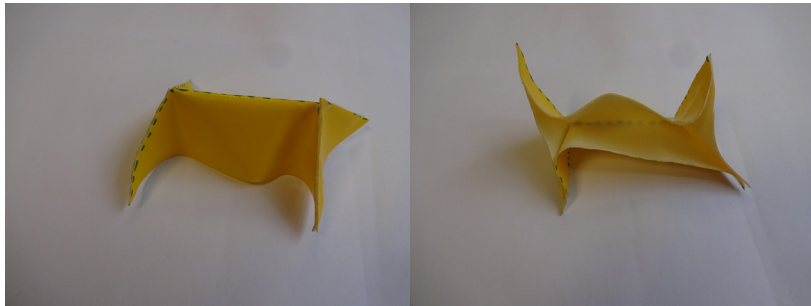
## MATERIAL TESTING



I chose nylon coated fabric (PU coated) because of its waterproof property. Moreover, the fabric part can be glued together easily. The material is also light, which will be an advantage when the system is controlled by sensor and computer



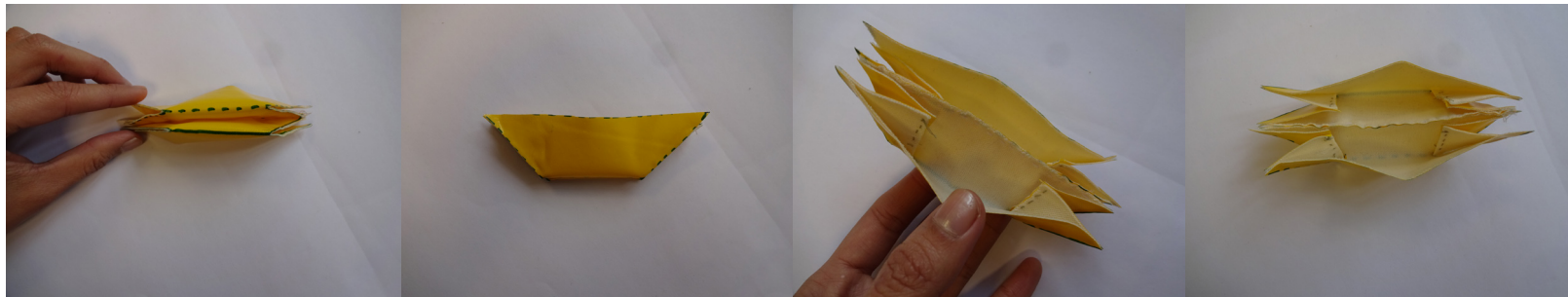
The fabric can be easily cut, sew and glue together. I tried one end with glue and the other end with thread. Both work well but the glue is faster and cover more area that can be hard to reach by hand when stitching.



Another experiment with cutting pattern



When connect the two elements, the stucture doesnt fold as I wanted

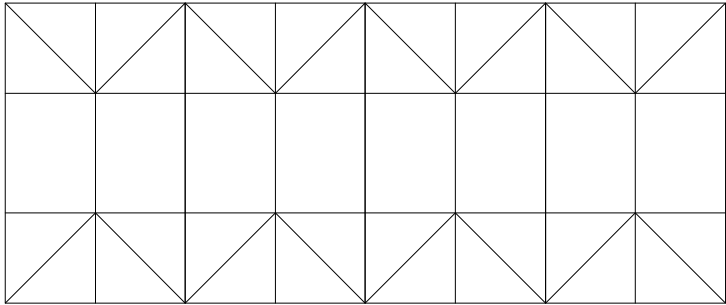
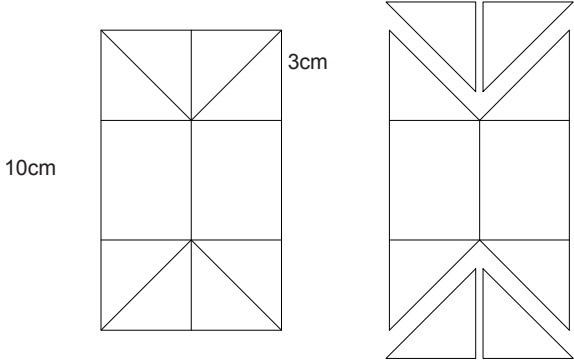
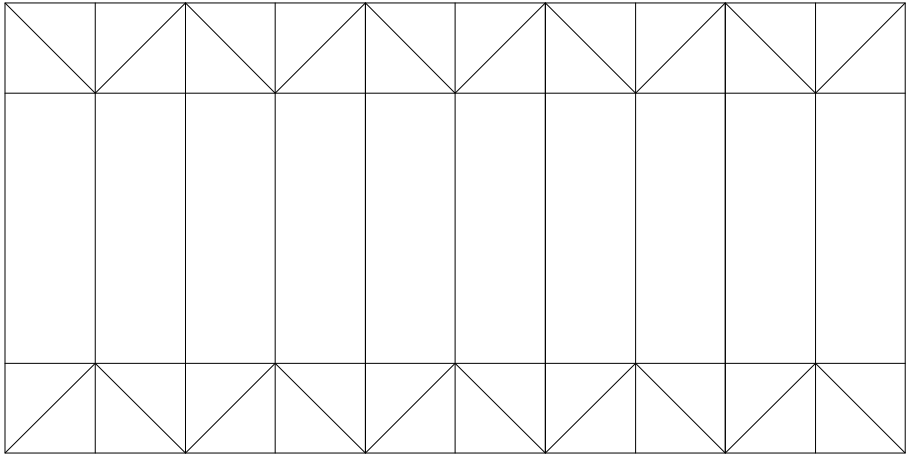
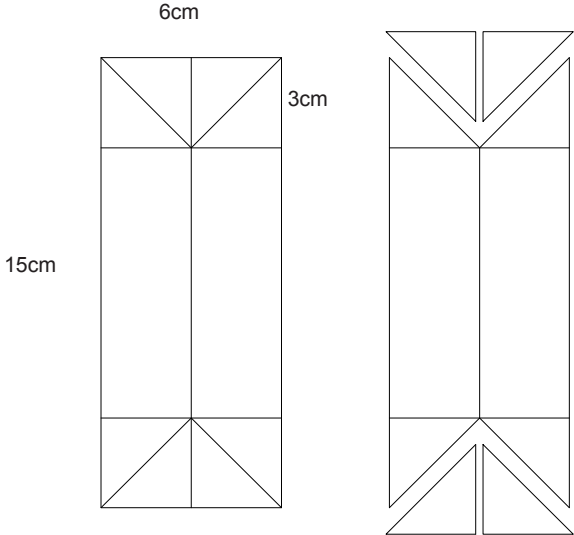


I added another line to the cutting pattern. The connected elements now can be folded and opened

ADAPTIVE MATERIALS (WITH TIME)

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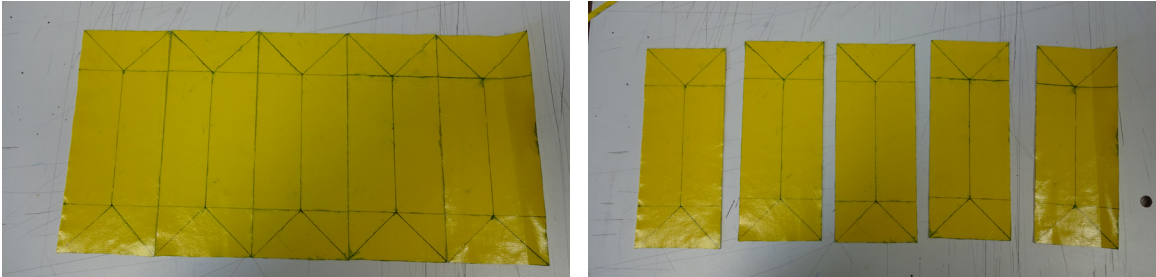
MAKING PLAN



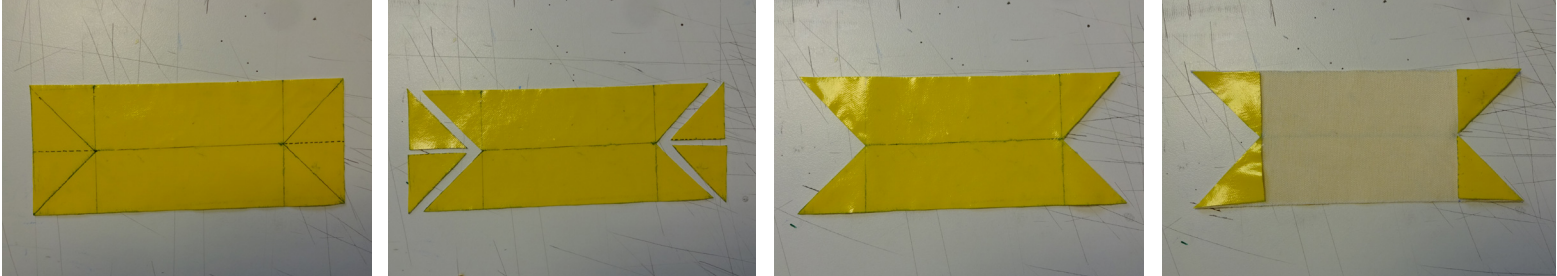
# ADAPTIVE MATERIALS (WITH TIME)

THAO P NGUYEN

## MAKING PROCESS



I drew the elements on the fabric first and cut out.

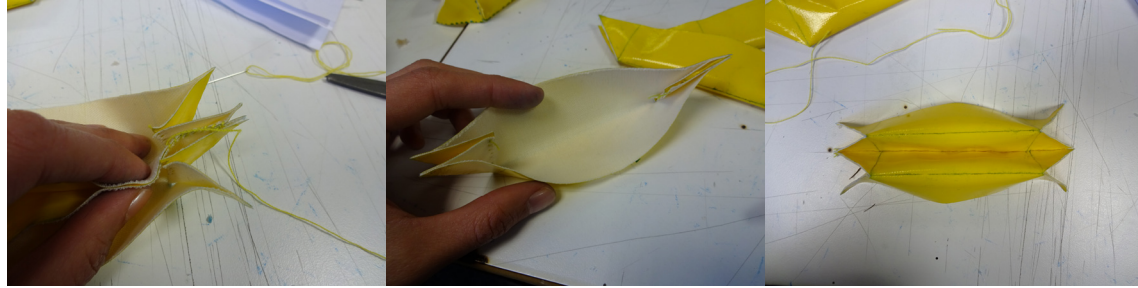


Each element is cut by parts and glue the ends together

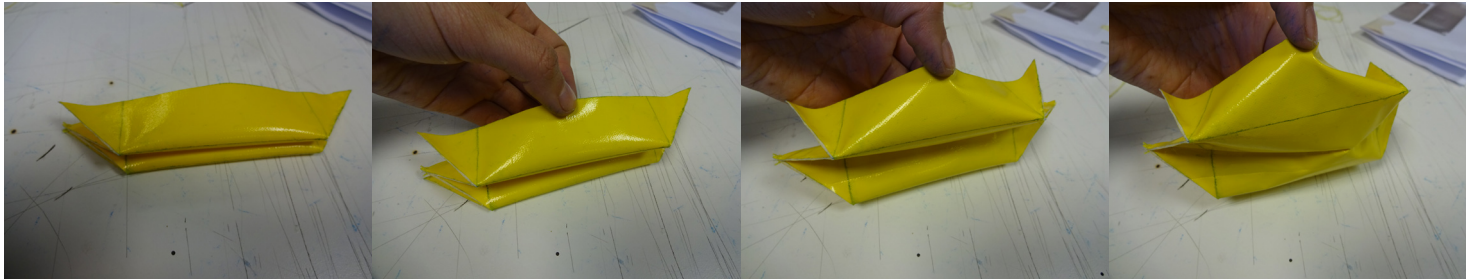
# ADAPTIVE MATERIALS (WITH TIME)

THAO P NGUYEN

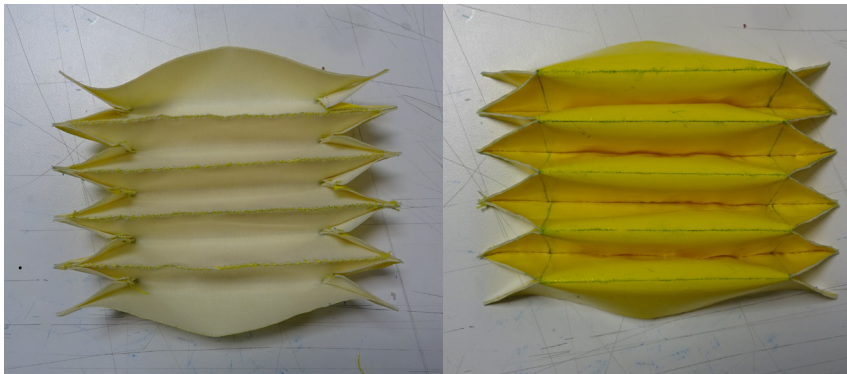
## MAKING PROCESS



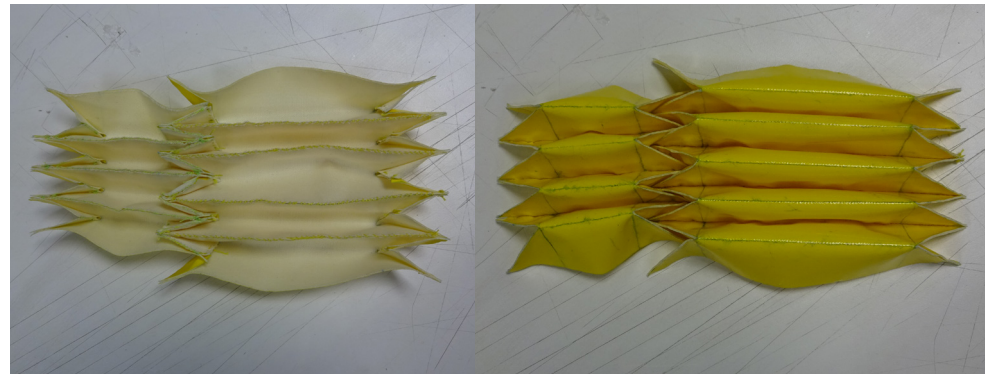
The ends are now connected by thread and also I use thread to connect the elements.



Try out how the elements work with folding and opening



Finished upper structure

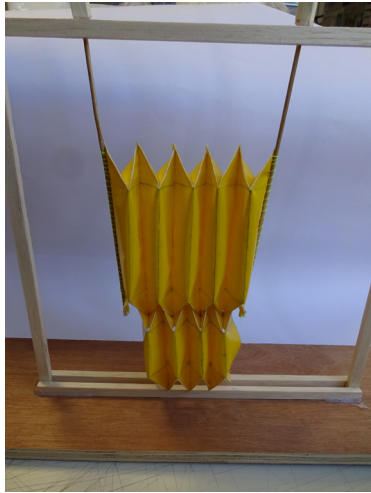


Attaching the lower structure to the upper one

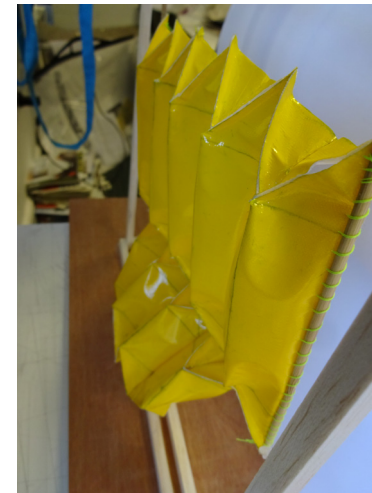
# ADAPTIVE MATERIALS (WITH TIME)

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## THE FACADE'S UNIT



The unit straightens out when the structure is unstretched



When stretched, the lower part tilts to create a rain cover