



# STUDIO JOURNAL

*NOTE: PLEASE ADD PAGES AS  
YOU SEE NECESSARY*

**SUSTAINABLE  
NOMADIC  
DESIGN**

**Churou Wang**

**SUSTAINABLE SYSTEMS**

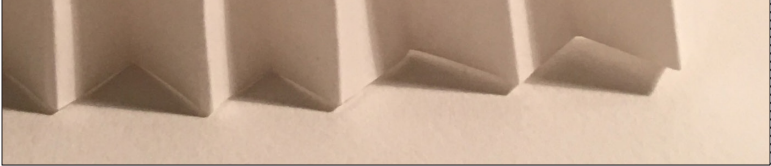
PARSONS THE NEW SCHOOL FOR DESIGN , FALL 17  
INSTRUCTOR: CAROLIN MEES

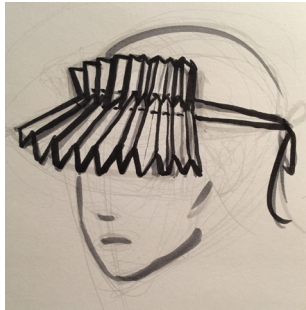
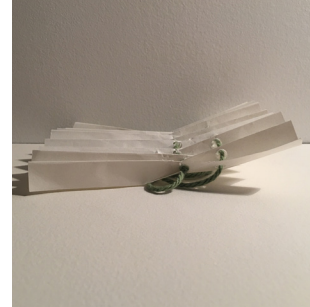
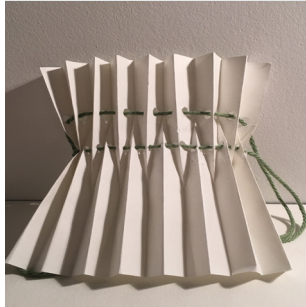
GLUE STRIP



GLUE STRIP

**SOCIAL & SYSTEMS**





Brim Hat model photos and the sketch

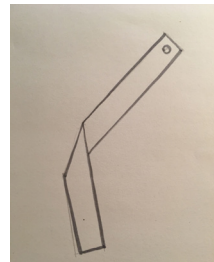
Since I have very sensitive eyes and bad near-sighted vision, the sunglasses or the bucket hat are my essentials when I go out. As mentioned above, the climate change not only raises up the temperature, the ultraviolet light gets more severe. The harmness it could possibly bring are

not only affecting bad eye-sight-people like me, but also everyone. So I think having at least a brim to block the outdoor sunlight for protecting our health is a must need. This hat design shares the same template with the first one. This hat leans more on the side of the sense of vision. It can be collapsed easily and very handy to carry around. Light-weight but does a lot of work. Simply wrapping the string at the back of the head, various-head-size friendly.

GLUE STRIP

Due to the rapid rising climate change these years. The sunshine in daily gets stronger, and gradually affecting people's health. From my personal experience, the top surface of the skull (top hair part) can get extremely hot when I touch it, which always shocks me since the body temperature wasn't that bad. I start to realize how the ultraviolet light has become very harmful to human hair and skull. People might not take this very se-

riously right now, but losing hair and low hair quality has never been wanted for any one. This hat is made of very simple template. It can be collapsed into a stick, and can be expanded like a fan by adjusting the string at the top. This gives the hat flexibility of fitting different sizes of heads. It is very portable for a hat when going out. And since it is assembled very easily by having a thread goes through, the budget and material economical.



photos of the hat model and sketches (last one shows the collapsed result)

GLUE STRIP



GLUE STRIP

# WATER & MATERIALS





SCOBY is the shorten name for symbiotic culture of bacteria and yeast. It consists of “anaerobic ethanol fermentation (by yeast), anaerobic organic acid fermentation (by bacteria), and aerobic ethanol oxidation to acetate (by bacteria) all take place concurrently along an oxygen gradient”.

It needs to be stored at a shaded area with the allowance of the flow of the air. In addition, there should not be any other bacteria other than SCOBY in the container, which might leads to the

mold. In order to help growing the SCOBY, it requires acidity to metabolize. Usually, kitchen vinegar is being use. With the help of the acid, there are millions of microscopic bacteria (in the scoby) spinning and building cellulose fibers in the container. The fibers come across to create a gel like foam at the surface. The foam expands to reach the edges of the container. After the growth, people can take it out, clean and wash the surface, dry it out. Then we can use it as a alternative vegan leather.



The bacteria starts to grow. The foam is bubbling.

GLUE STRIP



**(A) How is the color pigment extracted from the plant and fixed to the cellulose fibers? What is a “mordant” and what can be used as a mordant? Does natural dyeing work without a mordant?**

The color pigment can be fixed to the cellulose fibers by an object called “mordant”. “Mordant” comes from a french word “mordre”, which means “to bite”. It forms a coordination complex, so it can be used to set the color dye particles, and “locked” the color into the chosen fabric. Mordants include tannic acid, alum, urine, chrome alum, sodium chloride, and certain salts of aluminium, chromium, copper, iron, iodine, potassium, sodium, tungsten, and tin. It is no longer widely used, since it’s been replaced by a substitute called direct. There are some natural dyes do not need mordant. For example, Indigo and Wond.

Matthevs, Adam. “The Environmental Crisis in Your Closet.” Newsweek. April 13, 2016. Accessed October 06, 2017. <http://www.newsweek.com/2015/08/21/environmental-crisis-your-closet-362409.html>.

GLUE STRIP

**(B) What do you find out about dyeing and water pollution?**

There is a lot of other work to do before dyeing a piece of fabric. In most case, it need to be bleached, right, and then dyed. The bleaching process takes away the material's natural color. Chemical chlorine is used in bleach, which is very unhealthy to creatures. Tirupur, the "knit City", in India, there are a lot of factories producing dyeing garments and export to all around the world. The dyeing industries in Tirupur announced Tirupur was running out of water, which had greatly harmed the economy of the area and the agricultural industry. People living there has few agriculture produce due to the lack of healthy water.

**(C) Why is natural dyeing healthier for the environment and humans than chemical dyeing?**

The natural dye pigments are extracted from natural resources. So when the water used for dyeing flows into the river. It blends with the natural spring and could have been absorbed by the soil. Later, the health of plants and produce could be effected by the chemical particles contained in the soil. Furthermore, when human eats the plants, or meat (animals may also drink this water), human health could be influenced as well. In addition, the chemical dye is relatively harmful to human skin. Since dyeing process is mostly for making garments, what really touch the human skin is important.

GLUE STRIP



## Natural Plant-based sources

that could be found in NYC

1. beets
2. berries
3. red cabbage
4. onion
5. prickly pear cactus fruit
6. fungi
7. tumeric
8. butternut



„Natural Dye Colored Easter Eggs.“ BigSisLiSiS.  
April 21, 2017. Accessed October 06, 2017. <http://bigsislilis.com/2010/04/02/natural-dye-colored-easter-eggs/>.

Other than dyeing the fabric, dyeing Eastern eggs is a very common natural dye process the most of American families have experienced. Normally people use onionskin, red cabbage and beets.

For my dyeing project, I want to go with onions and beets. Since I have experienced how they retain the color on my wooden spatula when I was cooking. So I think these two sources may work successfully as my dyestuff. Furthermore, comparing to the fungi, these are more price-friendly for the first natural dye experiment. I assume the onion skin would provide a light yellow color while beets give a red pigment.

## **how to waterproof both the wool and the bioleather**

In order to waterproof the wool, I think it's better to add an additive into when blending the wool. I assume polyester fiber is a good source to use. It provides the wool smaller particle gaps in between. So when it rains, the water doesn't go into the inner side of wool. It also strengthen the quality of the wool.

For the bioleather, it naturally provides a smooth surface which allow the water drops to slide across. So when water rains from above of the bioleather, it would not be absorbed into the leather.

GLUE STRIP

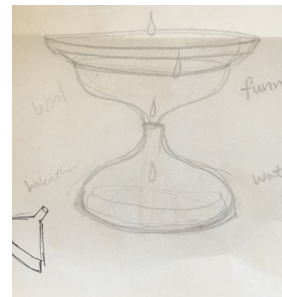
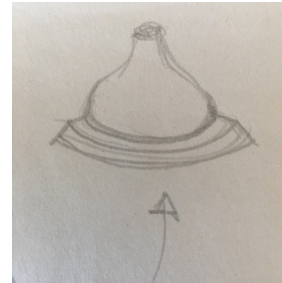
## NATURAL DYE PROCESS [ONION SKIN]



GLUE STRIP

**WEARABLE  
WATER-COLLECTA-  
BLE  
OBJECT**

**[DRAFT]**

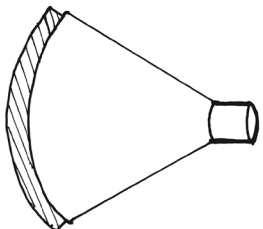
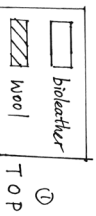
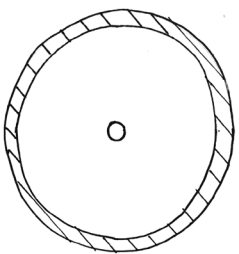


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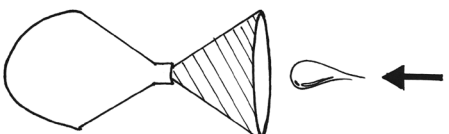
What I have designed is a water collectable hat. It has two layers (made of wool and bioleather; both have been waxed for waterproof) When in need of collecting, take the underneath wool part upside down and connectes with the peak of the bioleather part. For simplify of the whole construction, one part of the hat is a funnel, and the other piece is a water bag.

GLUE STRIP

WEARABLE  
RAINWATER COLLECTABLE  
OBJECT



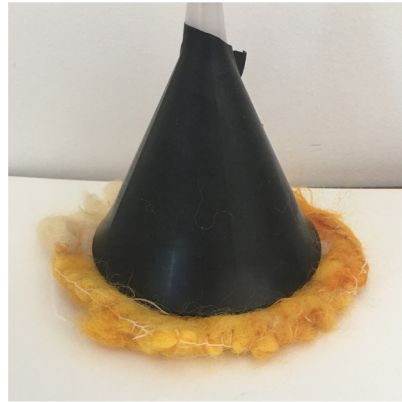
③  
SIDE  
(not in use)



③  
SIDE  
(in use)

## PROTOTYPE

I used various type of material to immitate the bioleather. I tried cyling film and ballons. For the wool part, the matearial came from my natural dye exercise.



GLUE STRIP

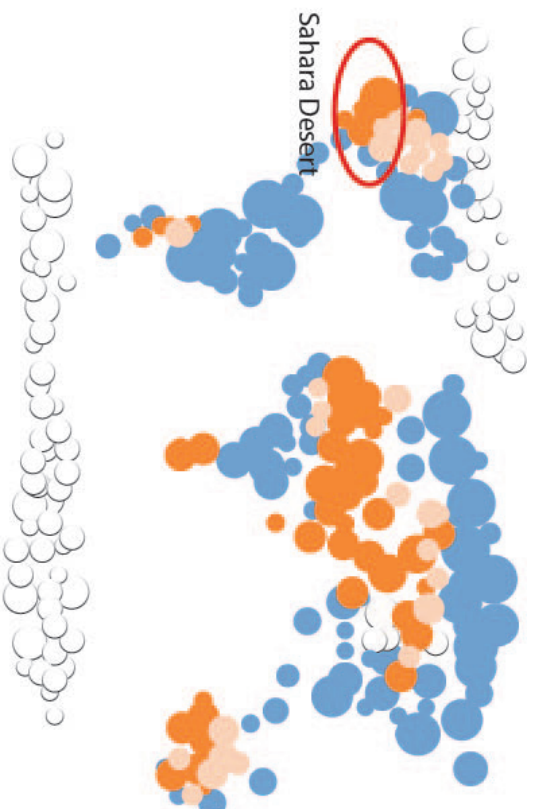




**CLIMATE CHANGE & ENERGY**

GLUE STRIP

GLUE STRIP



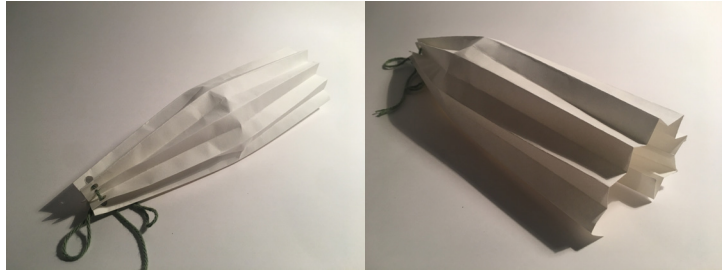
Sahara Desert

- hyper arid
- arid
- humid
- ice

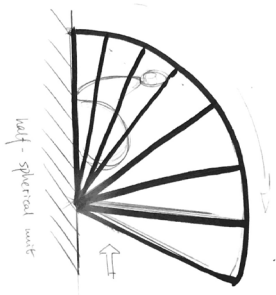
GLOBAL DESERTIFICATION

The structure I want to design for my character is a shelter which provides water source and remain the room temperature as stable as possible. The weather in mornings and nights have distinctive temperature difference in desert. The wall of the structure would be hollowed layers embedded, in order to retain the warmness. Meanwhile the fabric using for the inner wall could help the temperature as well. I aim to let the inner structure has a space for plants. More specifically, cactus and aloes. These two can help the humidity of the indoors and are very suitable for the desert extreme weather. Furthermore, they can be used as extra water sources.

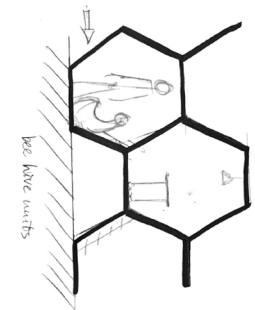
GLUE STRIP



spindel shape unit.



half-spherical unit

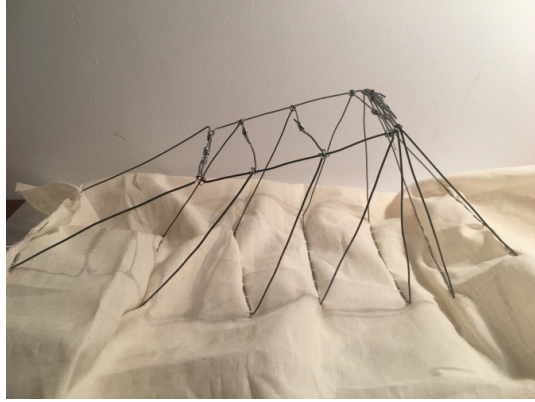


bee hive units

GLUE STRIP



GLUE STRIP



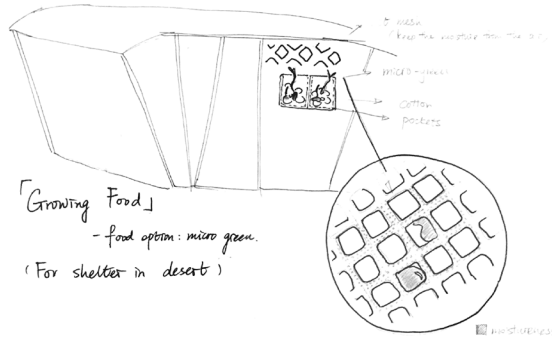
GLUE STRIP



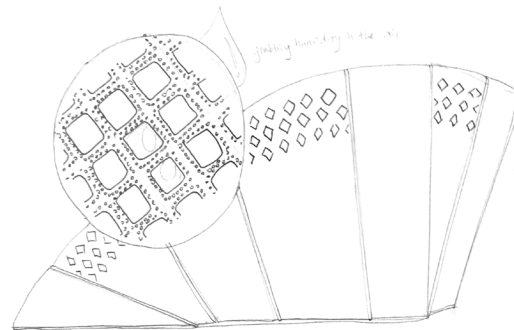


compeleted model

GLUE STRIP

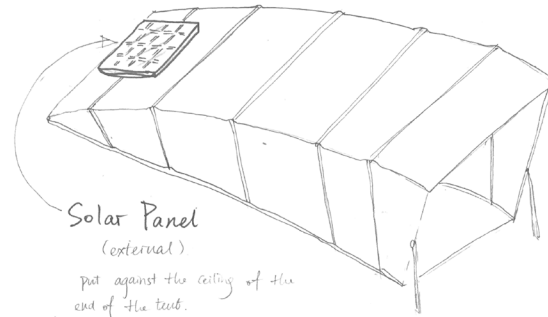


「Growing Food」  
 - food option: micro green.  
 (For shelter in desert)



Maintain the moisture for the living.  
 - Mesh NETTING.  
 When de-hydrating water is needed in extreme situations,  
 the tenant can squeeze the fabric and collect the water.  
 In doing, the water stays in the fabric to create a healthy  
 humid environment.

GLUE STRIP



Solar Panel  
(external)

put against the ceiling of the  
end of the tent.  
The angular setting strikes the diagonal  
support, while ensure its facing upwards  
to get the most sunlight (solar power)

The desert shelter I designed is capable of absorbing the humidity in the air, food production, and solar energy collection. To my opinion, when someone living in the desert, the relative humid environment for living is essential. Not only to skin and breath, but also mentally soothing the stress under the extreme environment.

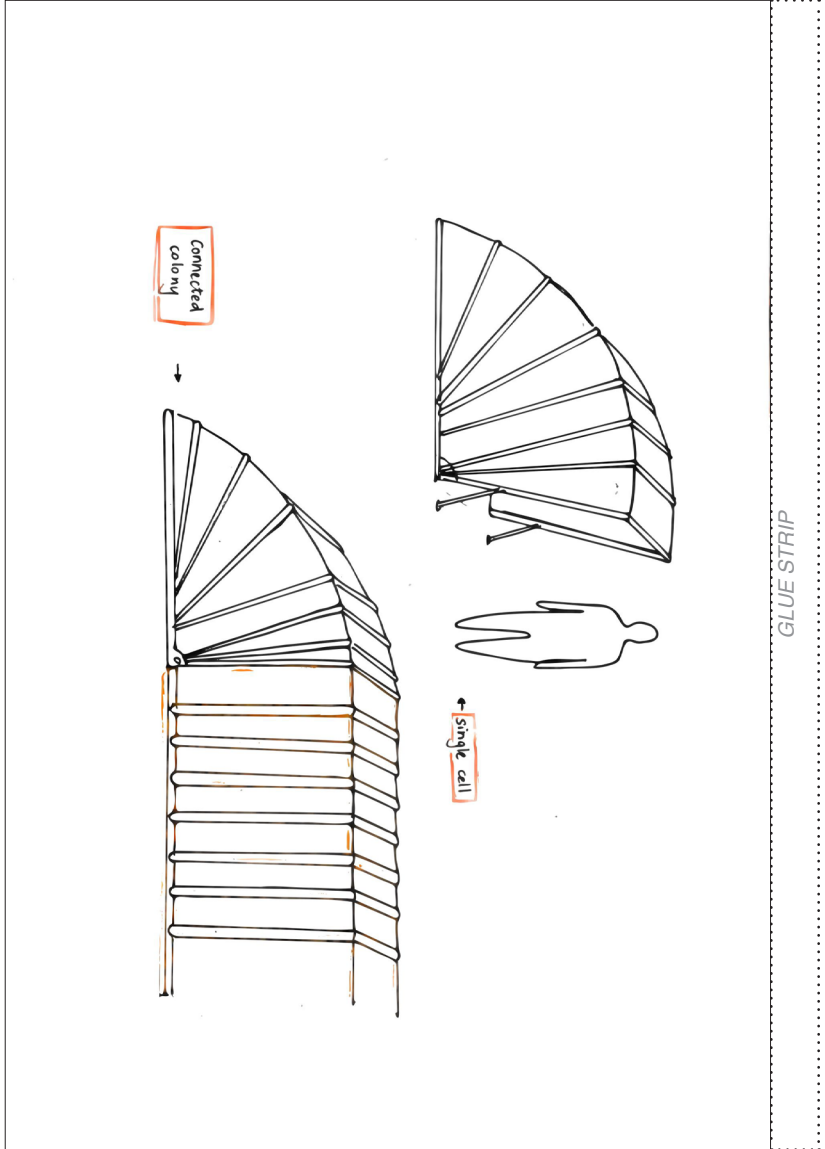
GLUE STRIP

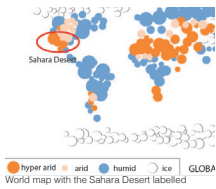
My goal for the structure is to create such area for the tenants to have a place with constantly moisture home. The netting mesh fabric is able to absorb the humidity from the air, and maintain them in the structure. If drinking water is needed in extreme situation, the tenant can simply squeeze the water from the fabric. (since the cover for the shelter structure is relatively soft)

Micro-green is a revolutionary food strategy in recent years. In this case, I am showing the possibility of growing green bean sprouts inside the tent. The sprouts can absorb water from the netting mesh fabric (it grows in a pocket which attached to the mesh), using the cotton as a growing base. They do not necessarily need soil. In addition to the sunlight, they grown fine without much of the light, so perfectly grows in shades.

I have decided to use portable solar panel for the solar energy collection. It can lean against the end of the tent, which has a slightly diagonal structure supporting it facing up towards the sun light.

GLUE STRIP





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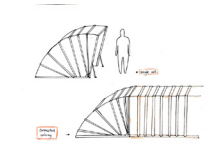
3 quarter view



interior with the floor production pocket

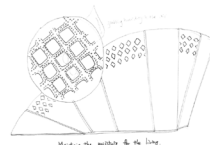


side back view



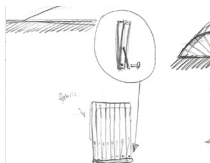
the image explanation of single cell and how it could later forms a colony

My desert shelter design is different from the living system of the corals. My structure cannot divided itself. However, it functions as individual, as well as the shelter colony. The structure of the same shape can be joint together to form a elongated slope. This shape is for protection from the strong wind at night in the desert. When the colony reaches a certain length, it can be a curvature, which shapes like a loop.



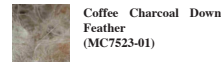
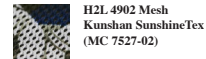
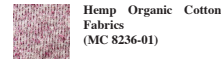
the mesh fabric structure

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(part of the sketch) expanding the collapsing system

The collapsing system is made of aluminum for its light weight, provides advantage for portable aspect. There are joint nails for flexible put in and take out. The user can have a flexible choice of how the curve should be when it's single user. Just insert hie nails on the aluminum bars to fix them.



GLUE STRIP

Desert Tent Chrou Wang