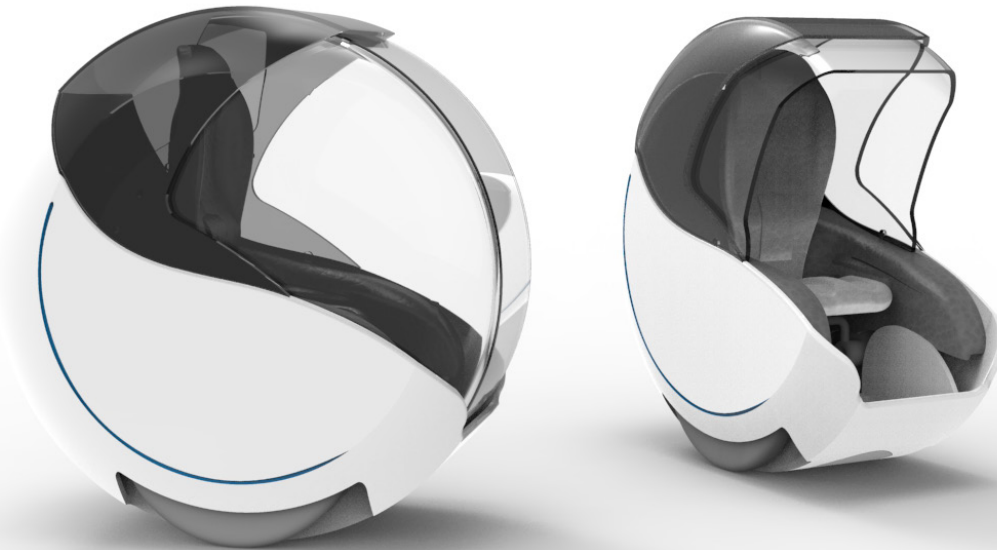


## CONCEPT PROJECT

DESN 331B  
INDUSTRIAL DESIGN  
SPRING 2018  
INSTRUCTOR: WESLEY WOELFEL  
STUDENT: PUYI LIU

# CHA-CHA Rocking Car



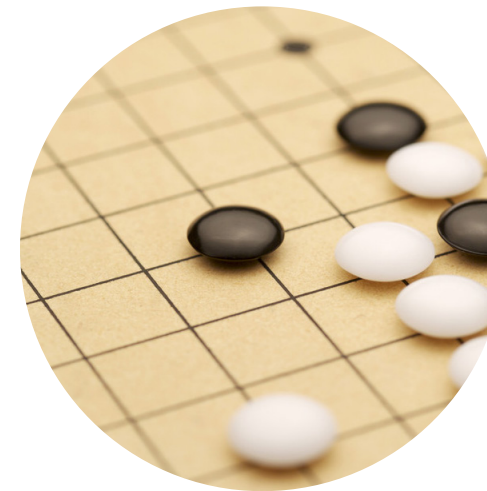
DESN 331B  
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# Existing Experience

I was living in China for 19 years. My favorite time is playing the eating during the festivals. In addition, I love the time spent with my grandparents. Although my grandparents have passed over, the memories we created are always there. Thinking of my grandparents enlighten me to create a product that brings safety, mobility, and happiness.



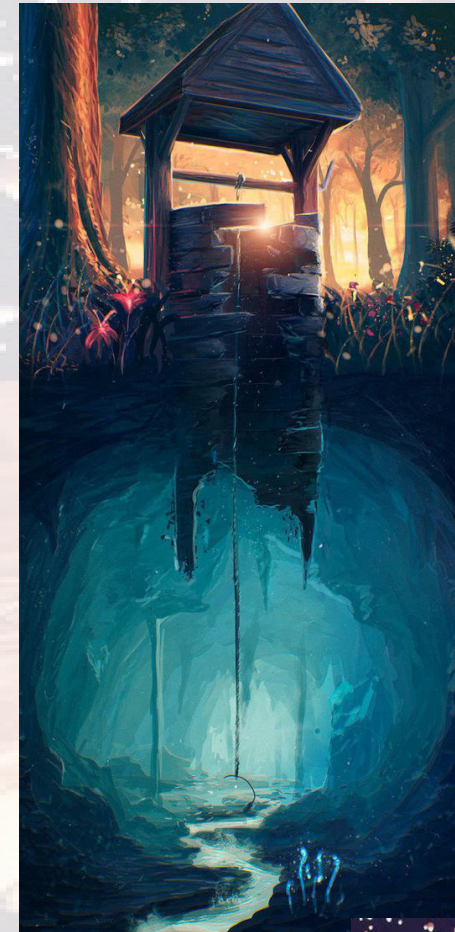
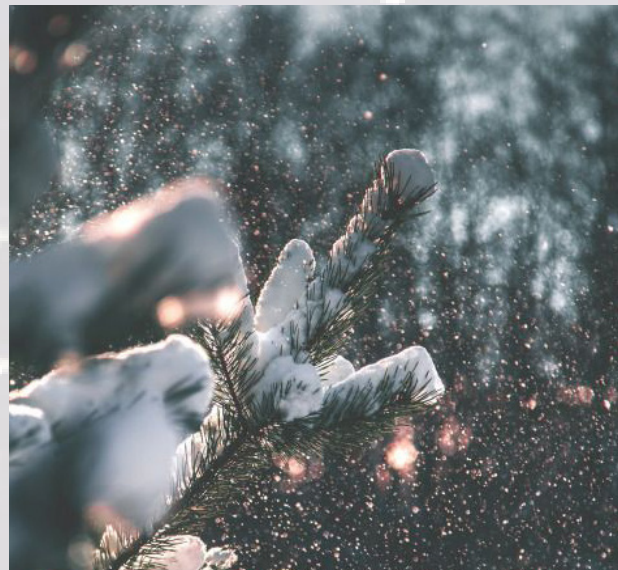


# Light Inspiration



I have both good and bad memory in my childhood. But I try to keep good memory in my product. When I recall my good time with family and friend, the scene is all under sunshine, and the scene is colorful with full of happiness. Also, sunshine is not like firework which is created by people, so I feel sunshine is very real.

**So I decided to use the natural light to be my light inspiration--Sunshine.**



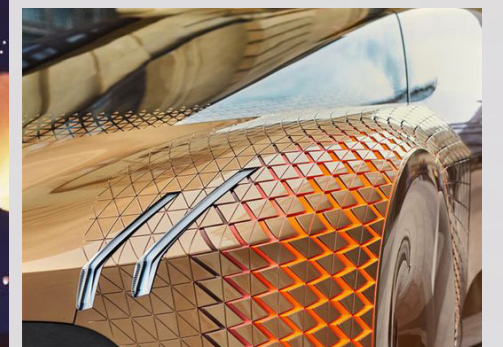
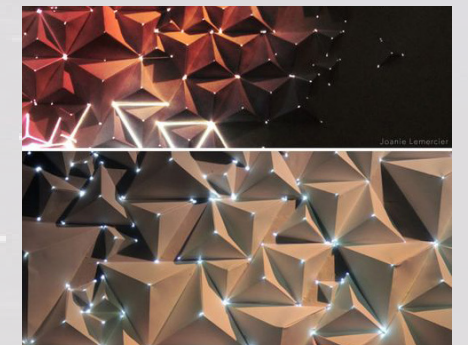
**HOPE:** I really like the light can make people feel warm.  
for example: sunlight from the gap.

**MEANINGFUL:** The light meaning something/ mention something.

for example: Kongming lantern  
Big Dipper/ Charles's Wain  
Spring festival fireworks/ just fireworks

**BEAUTIFUL:** it doesn't just light beam, it is transferred light  
for example: bubble light

sea surface light  
light from gap/ tree hole  
continue light drawing something.





# New Experience

I decided to create a chair that can go everywhere and incorporate the chair with high technology add-on features for safety precaution.

The main points that I want to bring to people are:

1. Comfortable/Relax
2. Communication
3. Privacy

## Mission

Making a furniture that brings convenience to human is my main focused point. The inspired by an air bubble, fireworks, and relationship between grandparents and grandchildren. All inspired will mix with FOCUSED, SMART, COMFORT, HAPPINESS, COMMUNICATION, and ECO-FRIENDLY.

# Ideal Scenes

GRANDCHILD TOM COME TO VISIT GRANDPA PAUL. TOM CAN SEE PAUL WANTS TO PLAY OUTSIDE, OTHERWISE TOM WILL PLAY VIDEO GAMES. BUT TOM CAN NOT WALK A LOT.

TOM AND PAUL DRIVE TWO CHA-CHA TO A PARK. AND PLAY A HID-ING GAME, KEEP PHONE ON. THEY TALKED A LOT AND HAPPY.

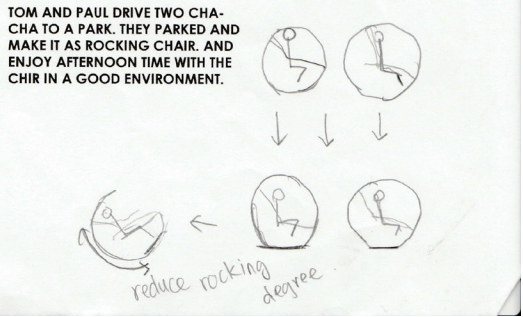
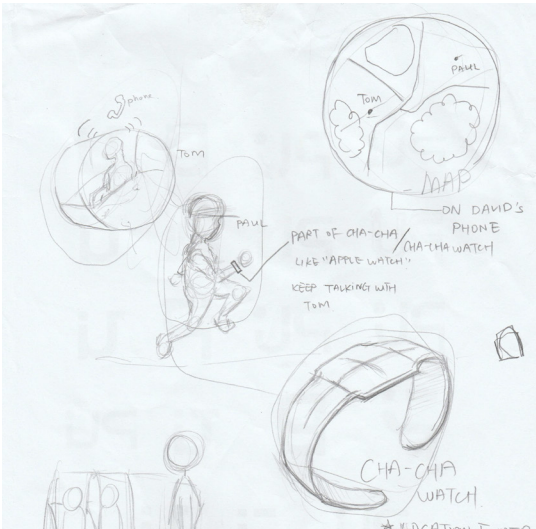
TOM AND PAUL DRIVE TWO CHA-CHA TO A PARK. THEY PARKED AND SWITCH IT TO A TWO PERSON FIT CAR.

TOM AND PAUL DRIVE TWO CHA-CHA TO A PARK. THEY PARKED AND MAKE IT AS ROCKING CHAIR. AND ENJOY AFTERNOON TIME WITH THE CHIR IN A GOOD ENVIRONMENT.



COMMUNICATION  
HAPPINESS  
MOVABLE CHAIR  
LOCATION FINDER  
PHONE CONNECT

TOM'S SON DAVID ARE MONITOR THEIR LOCATION FROM PHONE.



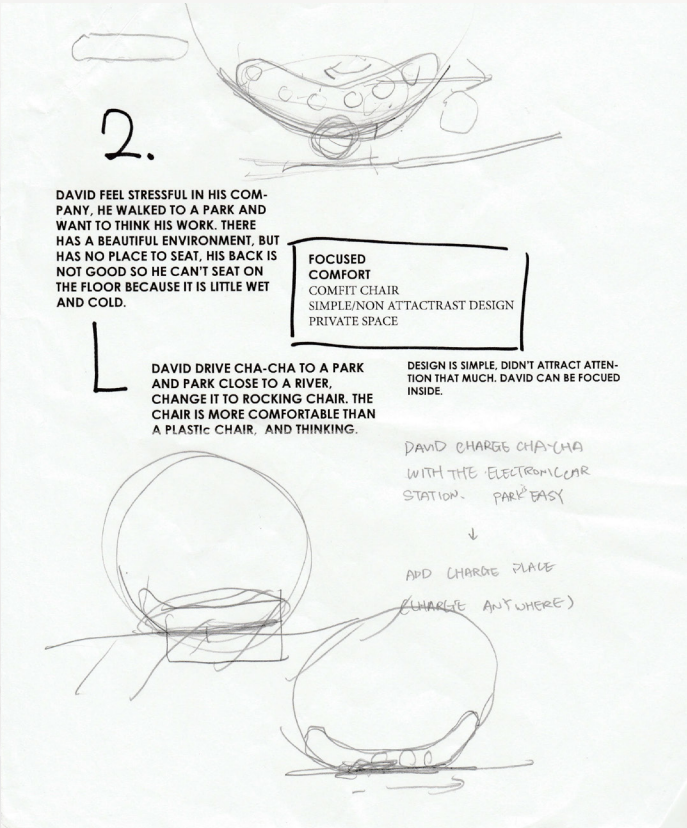
DAVID FEEL STRESSFUL IN HIS COMPANY, HE WALKED TO A PARK AND WANT TO THINK HIS WORK. THERE HAS A BEAUTIFUL ENVIRONMENT, BUT HAS NO PLACE TO SEAT, HIS BACK IS NOT GOOD SO HE CAN'T SEAT ON THE FLOOR BECAUSE IT IS LITTLE WET AND COLD.

DAVID DRIVE CHA-CHA TO A PARK AND PARK CLOSE TO A RIVER, CHANGE IT TO ROCKING CHAIR. THE CHAIR IS MORE COMFORTABLE THAN A PLASTIC CHAIR, AND THINKING.

DESIGN IS SIMPLE, DIDN'T ATTRACT ATTENTION THAT MUCH. DAVID CAN BE FOCUSED INSIDE.

DAVID CHARGE CHA-CHA WITH THE STATION FOR ELEC CAR. PARK EASY.

FOCUSED  
COMFORT  
COMFIT CHAIR  
SIMPLE/NON ATTACTRAST DESIGN  
PRIVATE SPACE





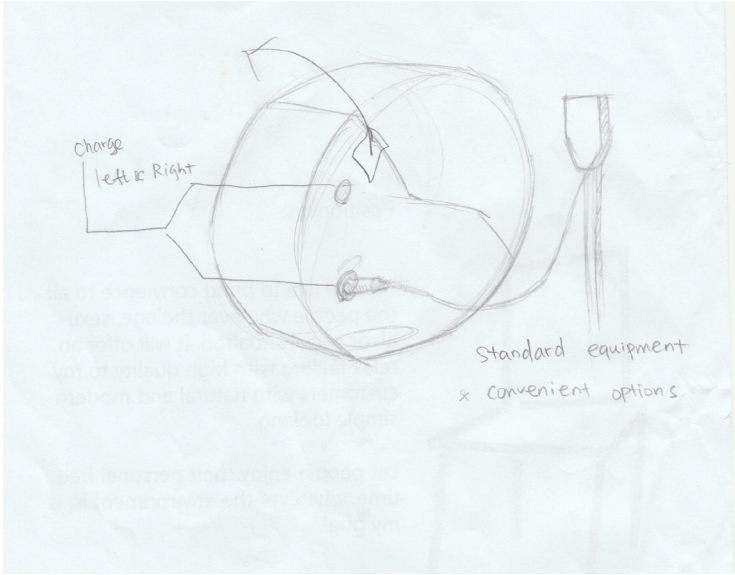
TOM WANT TO DO MORNING EXERCISE, BUT KIND OF TIRED TO WALK THAT FAR.

COMFORT  
SMART  
CONFORTABLE CHAIR  
SMART VEHICLE  
PORTABLE STORAGE  
BLUETOOTH FOLLOWING

TOM DRIVE CHACHA TO PARK, AND THEN PARK IT ON THE SIDE, OPEN THE WINDOW AS A COMFORT CHAIR, DO EXERCISE. AND SEAT AND DRINK WHEN REST.

TOM BOUGHT FRUIT WHEN HE COME BACK FROM PARK, HE PUT THE FRUIT ON THE CARRY CLOSET.

CHA-CHA CONNECT TO TOM'S PHONE, IT FOLLOWING TOM WHEN HE WALKS.



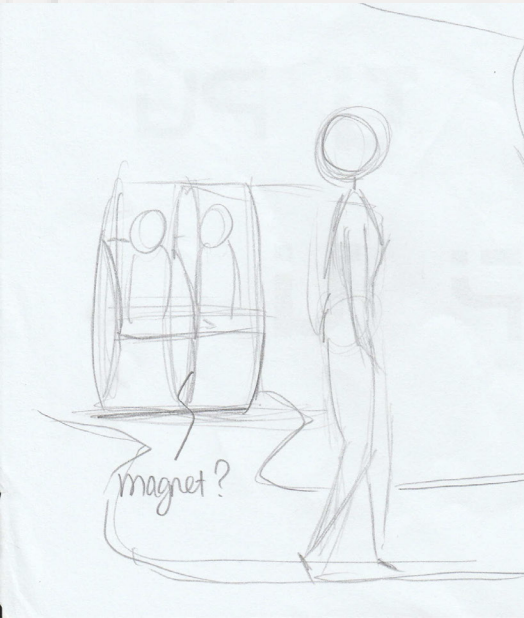
LISA AND ANNE WANT TO GO TO PARK TOGETHER, ENJOY THEIR AFTER-NOON, BUT THEY WANT SEAT COMFORTABLE.

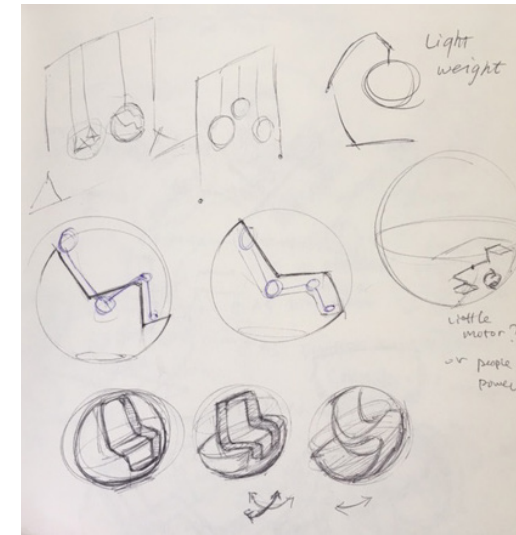
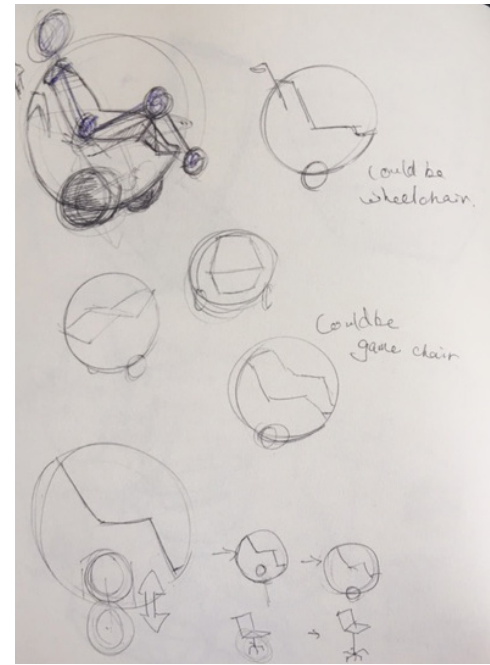
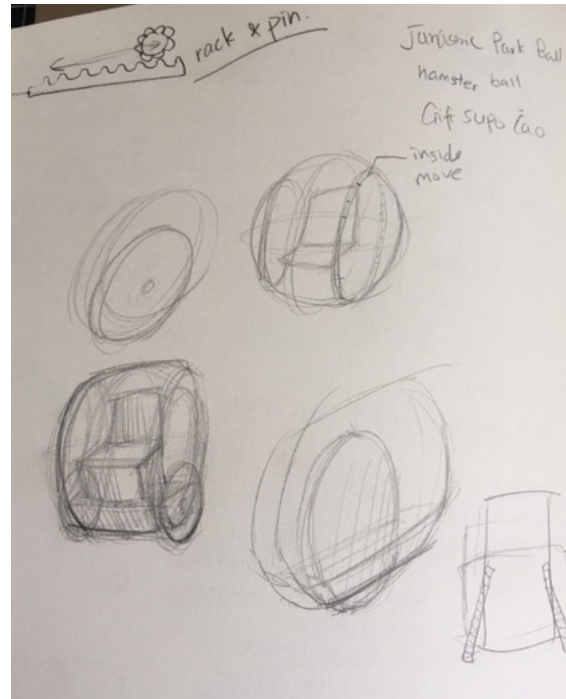
COMMUNICATION  
COMFORT  
COMFIT CHAIR  
CONNECTABLE CHAIR  
SELF DRIVE  
SMART

THEY DRIVE CHA-CHA TO PARK, ASK IT DRIVE SLOWLY AND ENJOY TALKING. THEN THEY CAN ENJOY THEIR TIME.

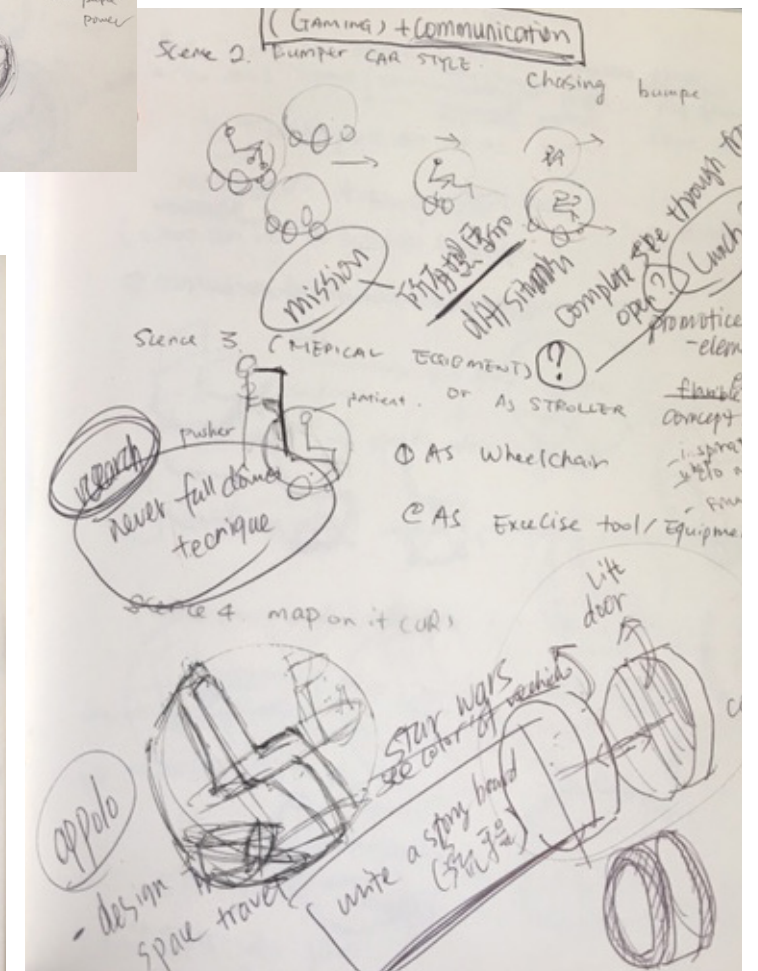
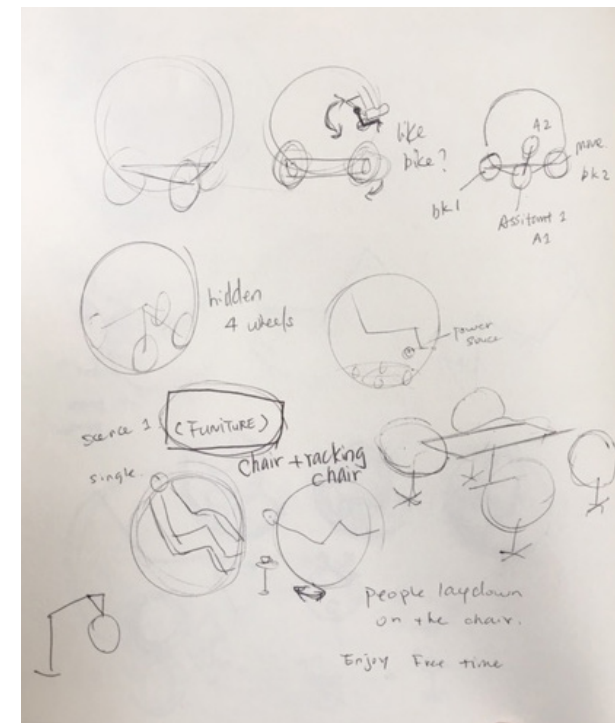
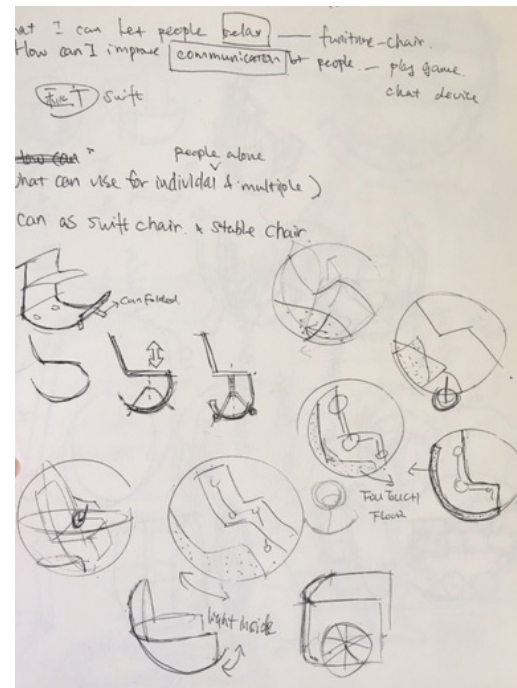
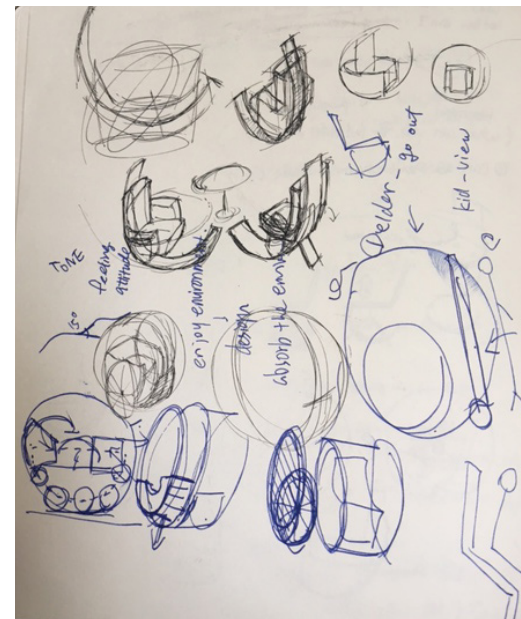
TWO CHACHA CONNCETED AND DRIVE SLOWLY.

CHA-CHA HAS GOD SHADE TO PROTECT SUN BURN.





# More Sketches



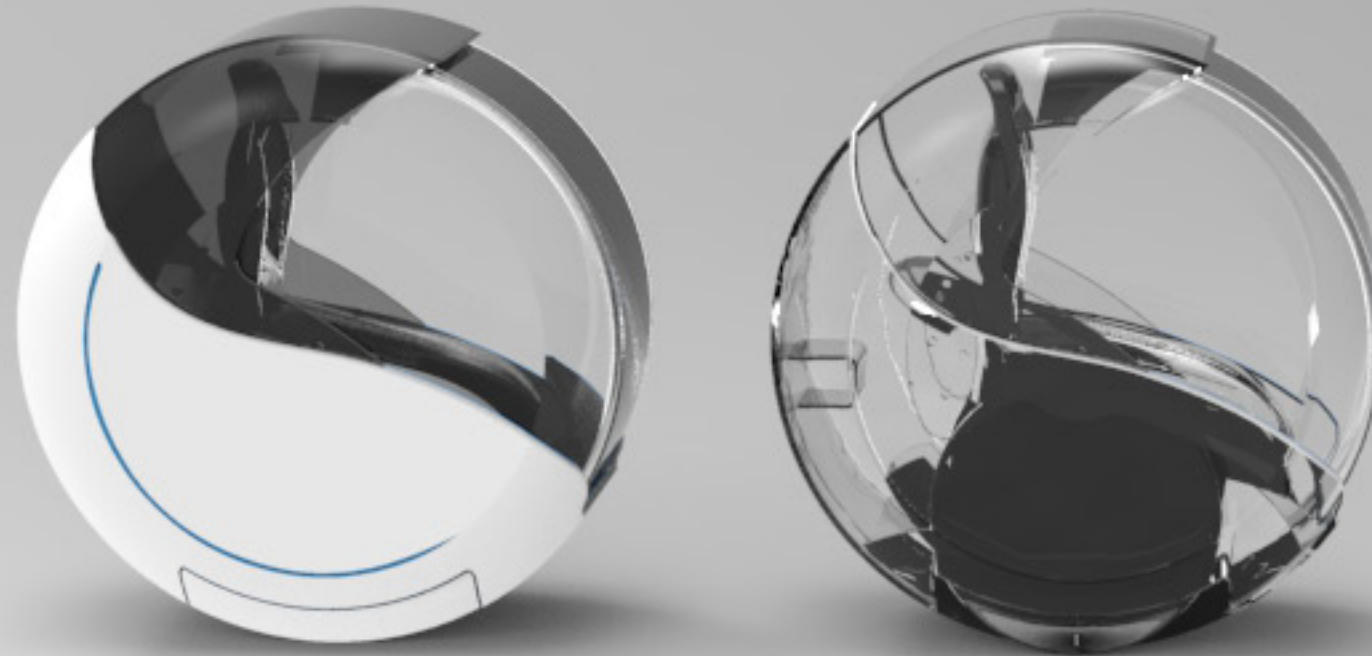


# Similar Products / Mechanical Researches



I want to make sure two wheels car can stand stable. Then I found some product can stand well with only two wheels.

# Product Introduction



## CHA-CHA Rocking Car

Chinese pronounce car is "Che". CHA is similar with CHE, and it is easy for English speaker to pronounce the word. And this product's second main function is rocking chair, so I choose Cha-cha to be my product's name, not only Cha.

1. Comfortable/Relax
2. Communication
3. Privacy

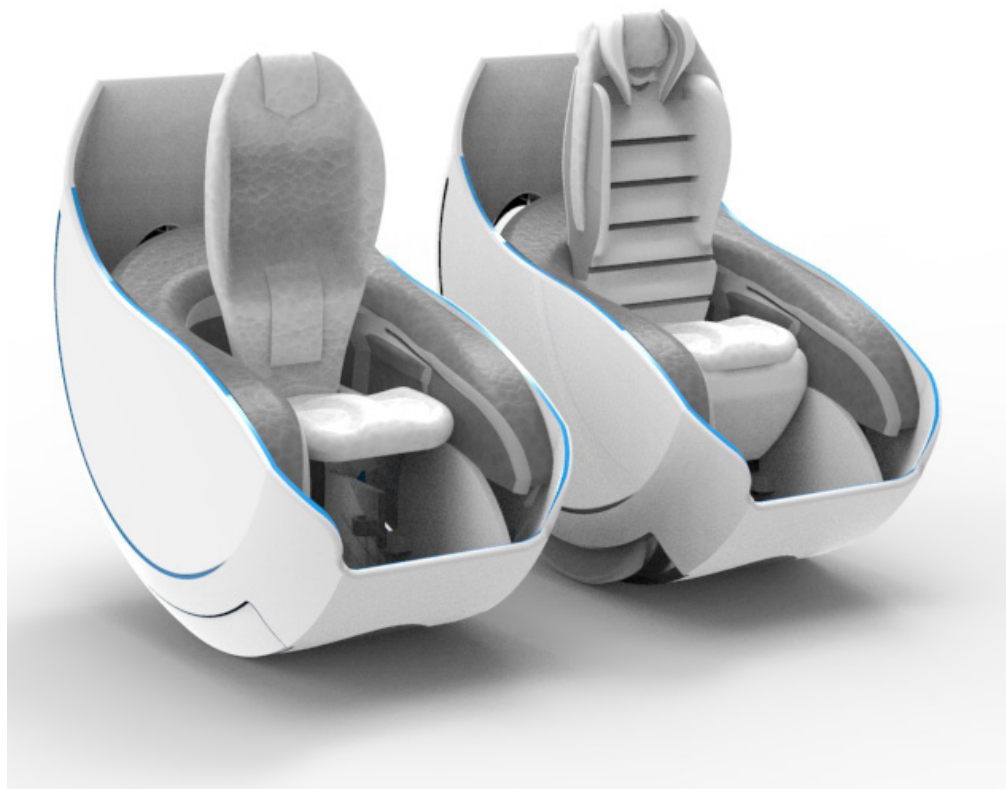


# CHA-CHA

## Rocking Car

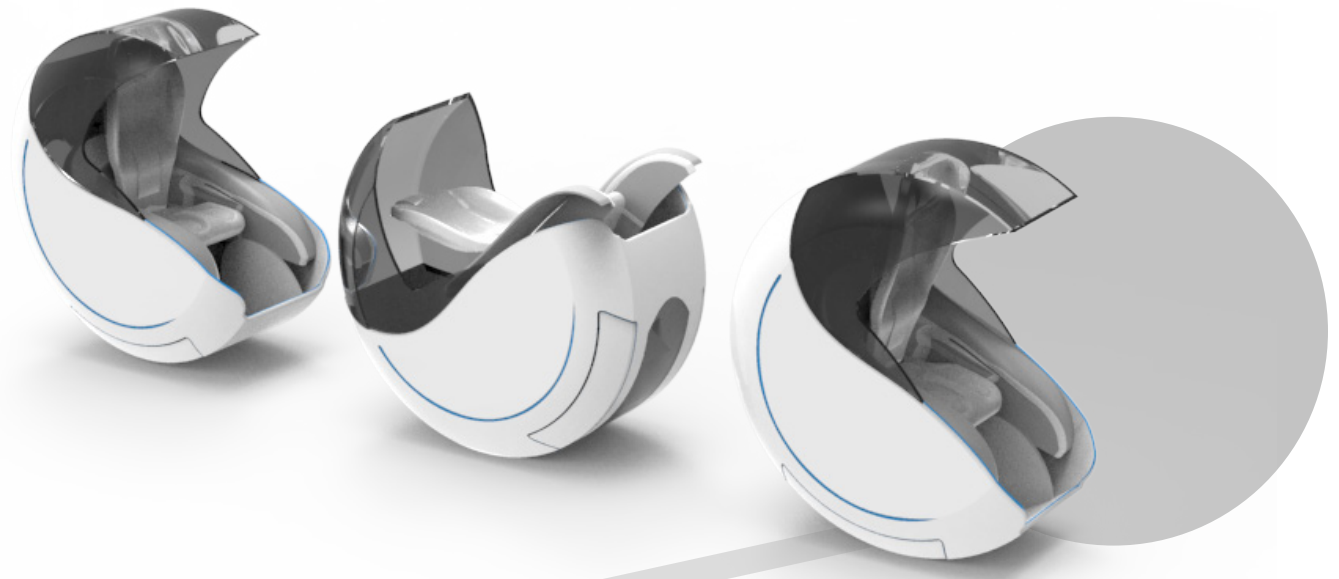
Cha-Cha is a multipurpose chair that is designed to improve the user experience. It can be either a lounge chair or a small vehicle depending on owner's need. The Chair can switch from its lounge mode to vehicle mode by elevating the base and extending the two wheels. Drive to a park, and enjoy your personal time with the Rocking CHA-CHA Chair, or have a small chase game with little children will be a good way to enjoy your leisure time.





## Comfortable Chair

Choose your favorite chair, and bring it to everywhere you want.



## Relax Rocking- Chair

People can enjoy the rocking comfortable chair in anywhere.

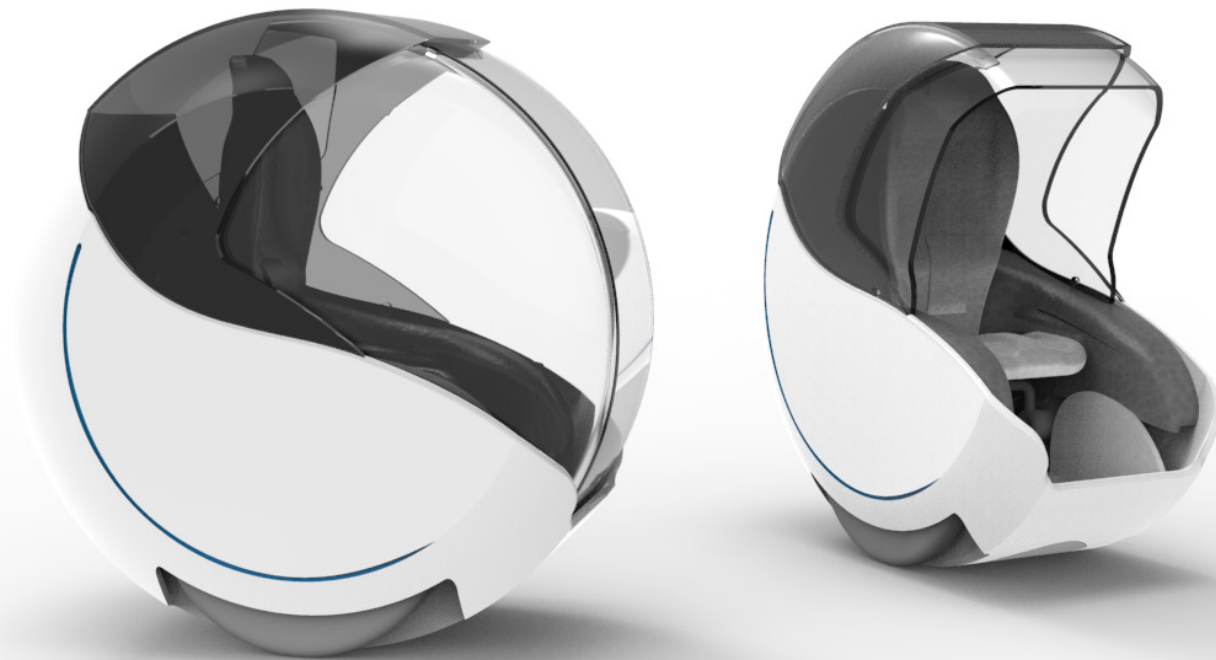


# PRIVACY



## Enjoy Your Time

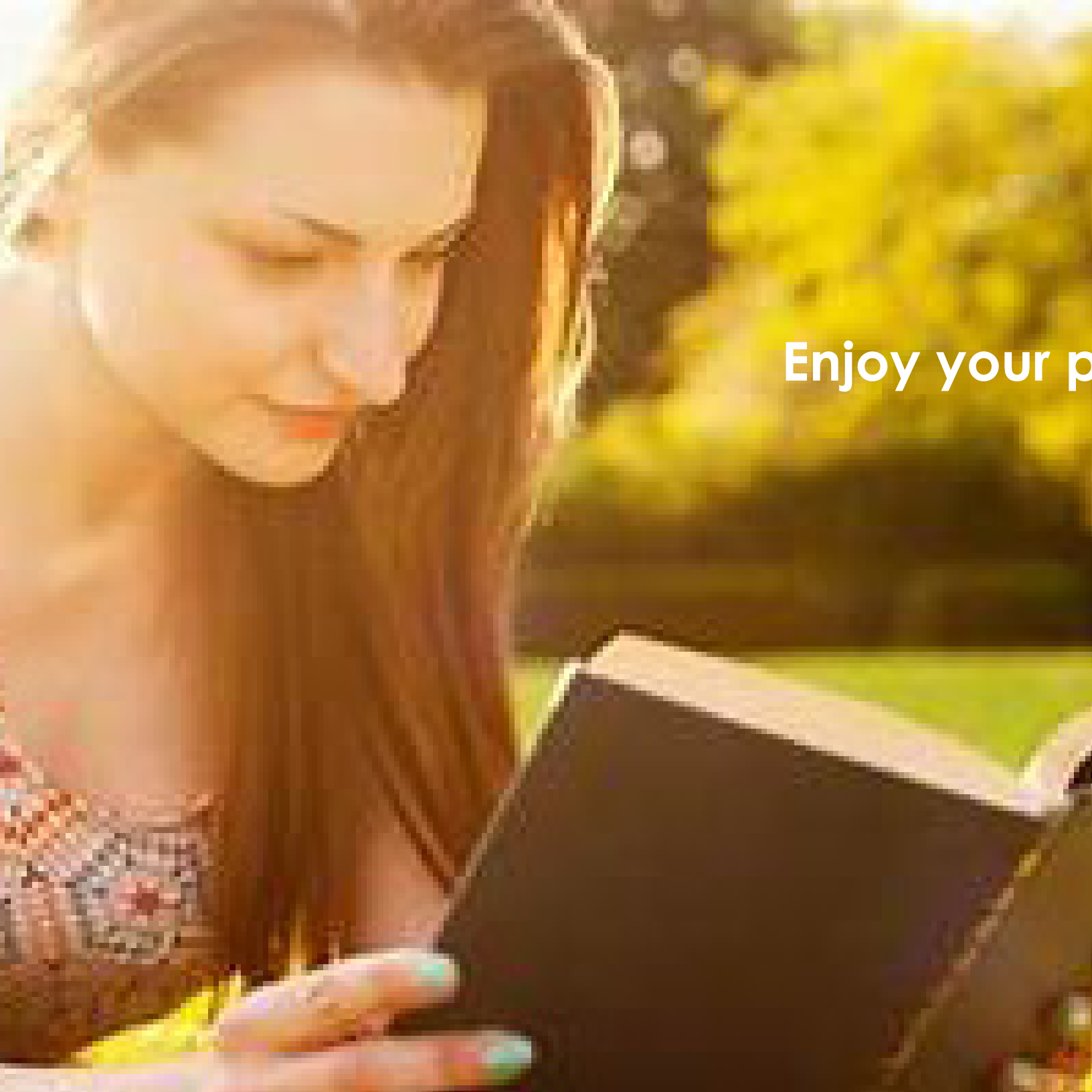
Imaging that you laying down in your CHA-CHA and enjoying the sunshine and reading your favorite books. Isn't this an relaxing way to spend your personal time?





**Now you need a place to  
be alone, and to think.**





Enjoy your peaceful time.

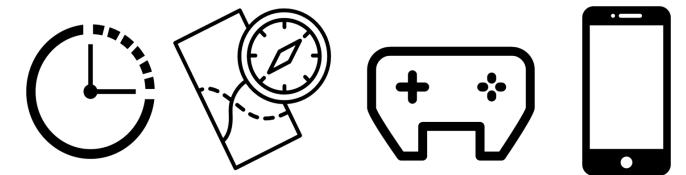


# COMMUNICATION

Basic functions as navigation and car telephone are applied to CHA-CHA for more convenience when people out, not for long distance travel, but very good for walking in a park.

Playing game together give people more communications, so I try to put a game option into my design. Drive out with your parents or children, have a slow racing game with them will be an happy experience for them, have fun!

## Bring Convenience to All







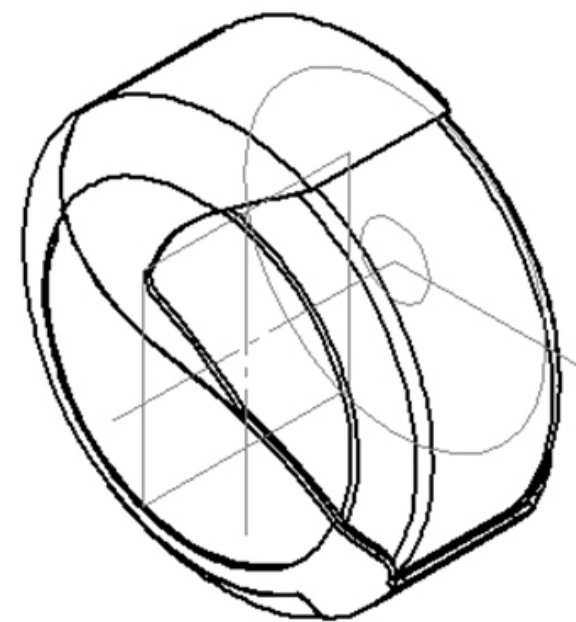
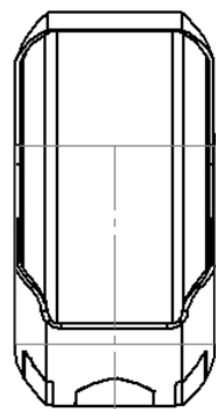
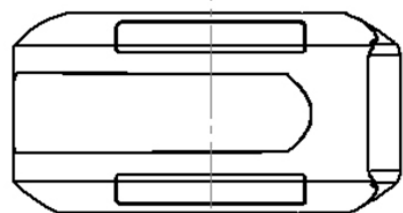
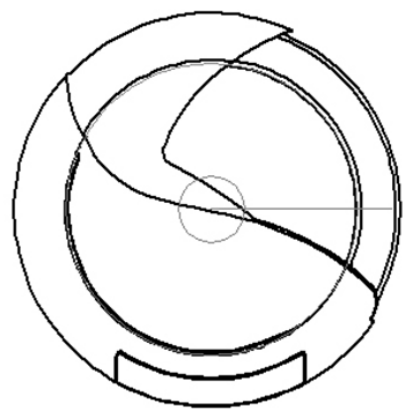
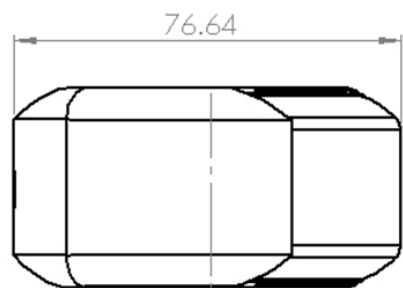
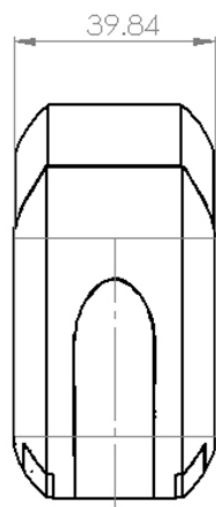
Extention chair helps disabled people walk out easier, it gives people more chance to enjoy outside environment, save human energy, also save time.

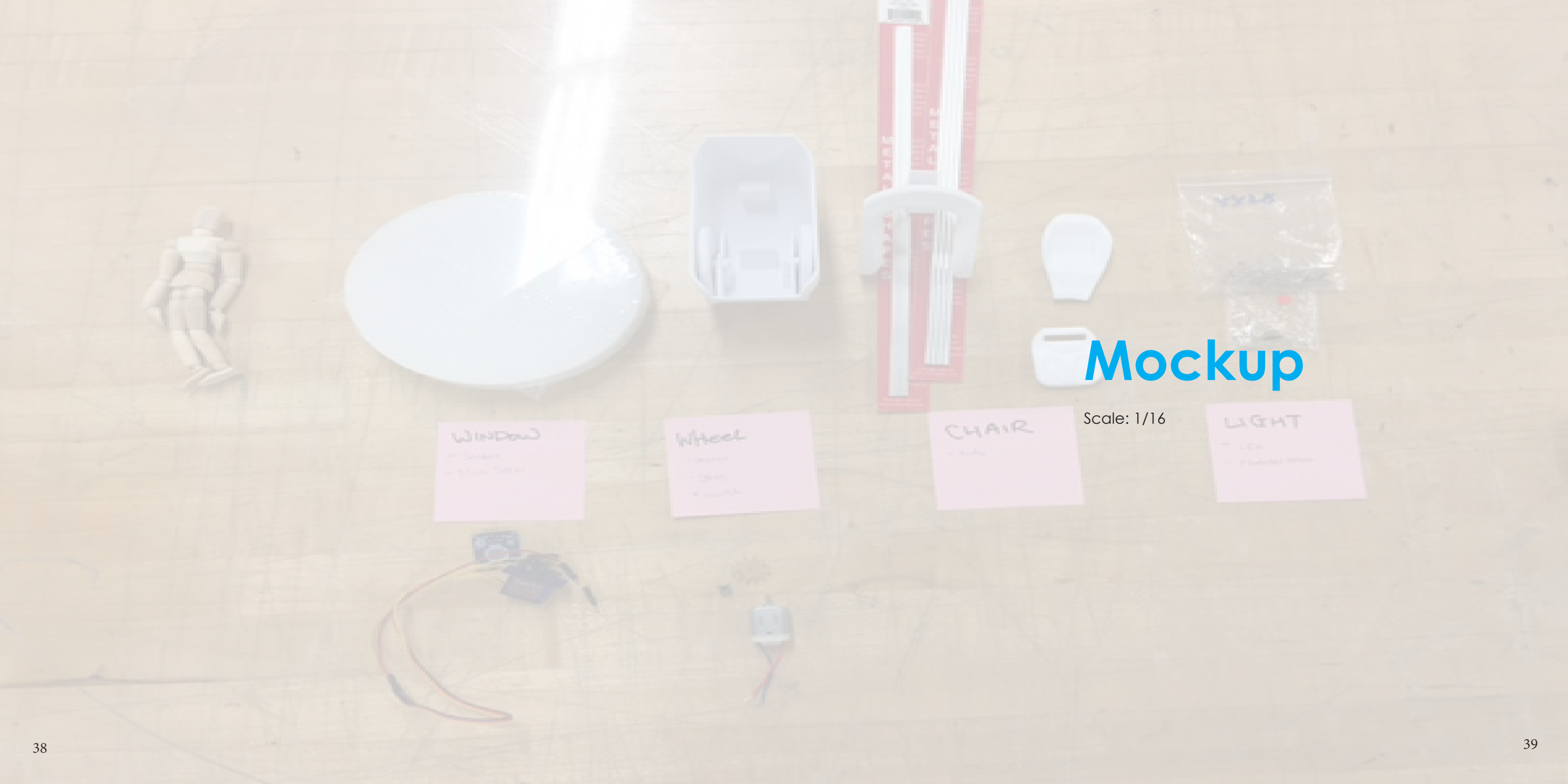




Enjoy our world.







# Mockup

Scale: 1/16

Window  
- Sensor  
- Motor

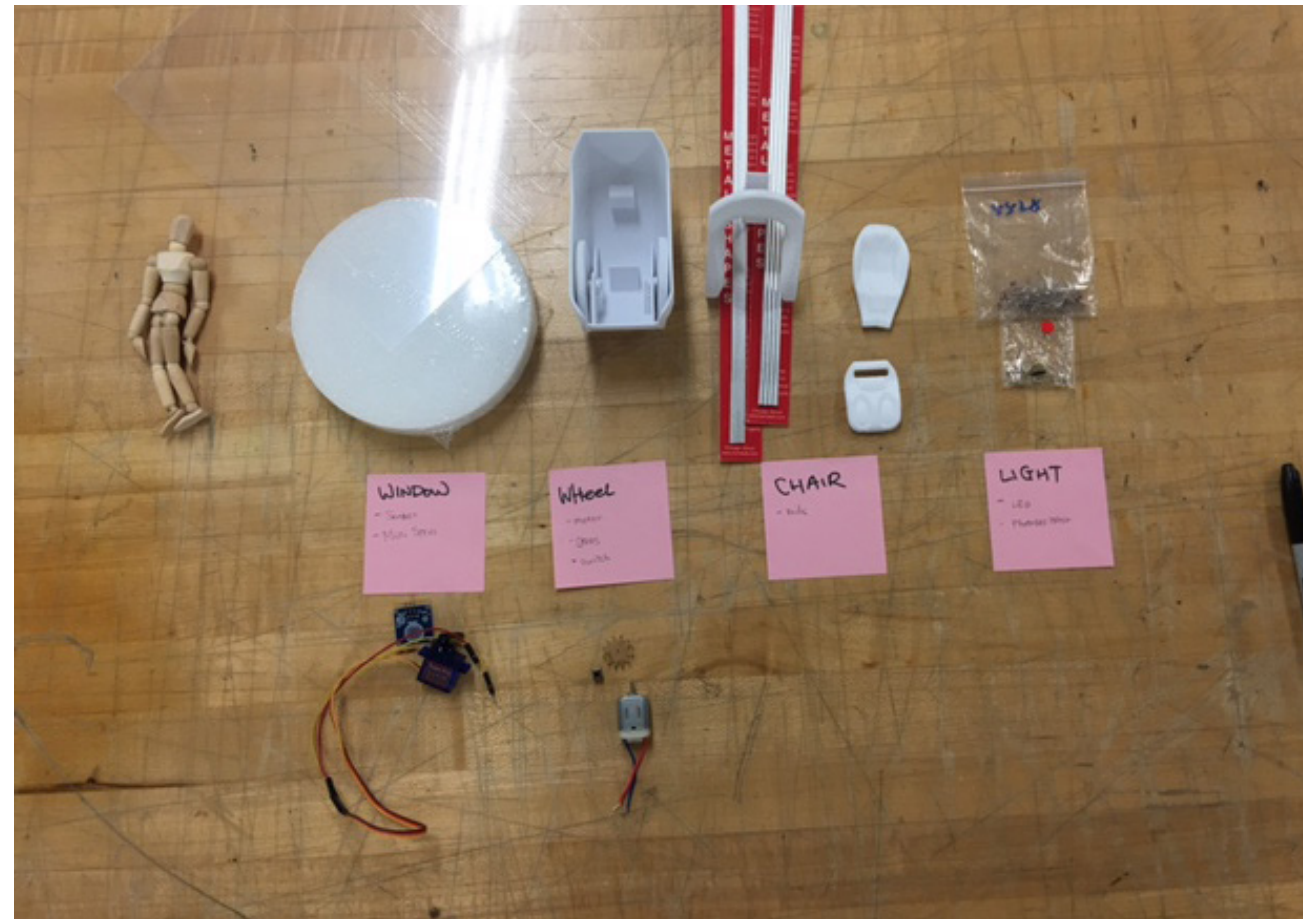
Wheel  
- Motor  
- Gear  
- Switch

CHAIR  
- Switch

LIGHT  
- LED  
- Pushbutton Switch



## Step 1 Plan

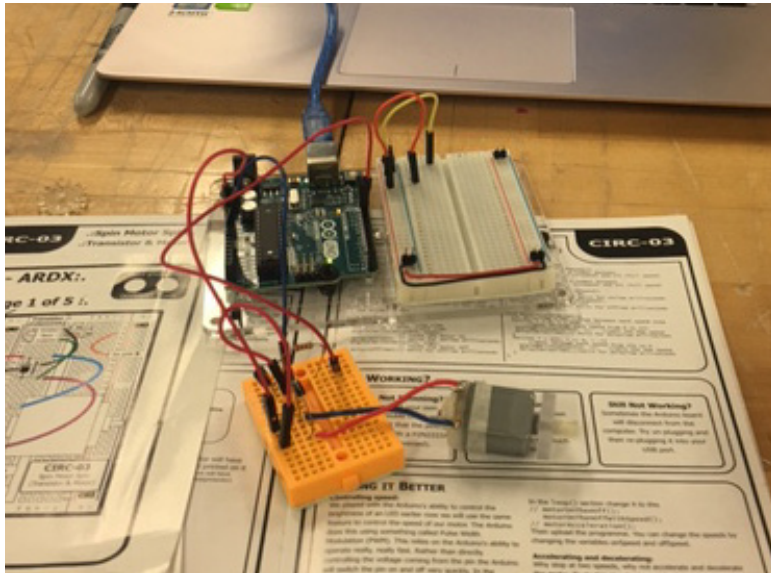
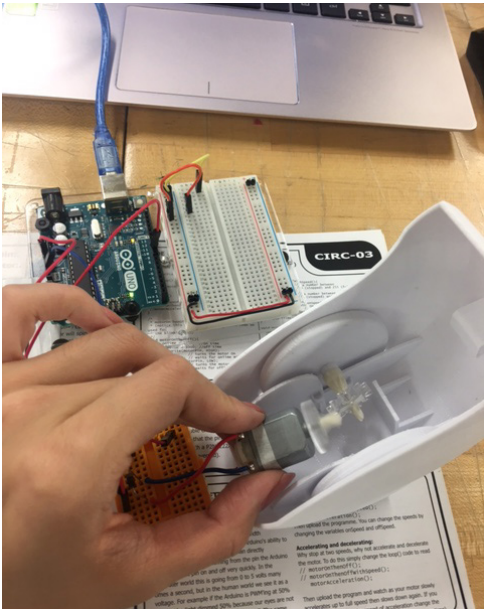
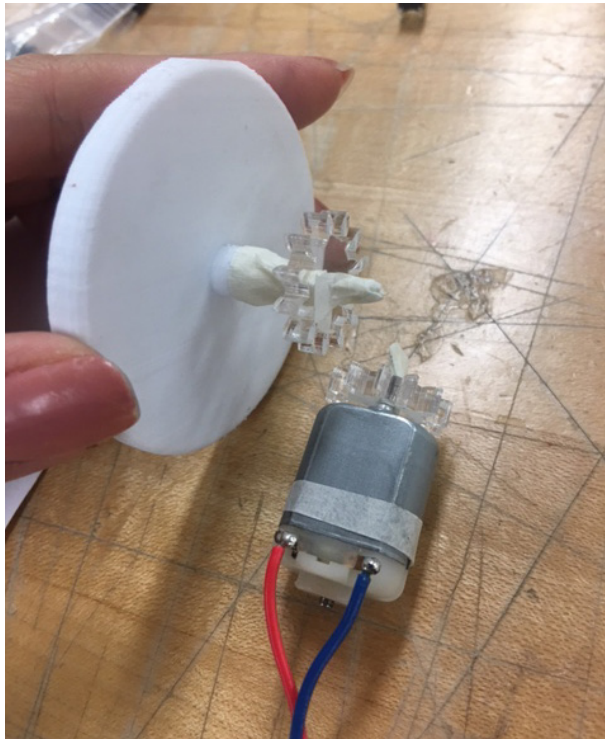


## Step 2 Mechanical and Coding

I seperated the mock up to four parts:

Window-Mini Servo  
Wheel-Mini Servo,  
Chair-Straw,  
Light-Photo Resistor & LED.

# Wheel- Mini Servo

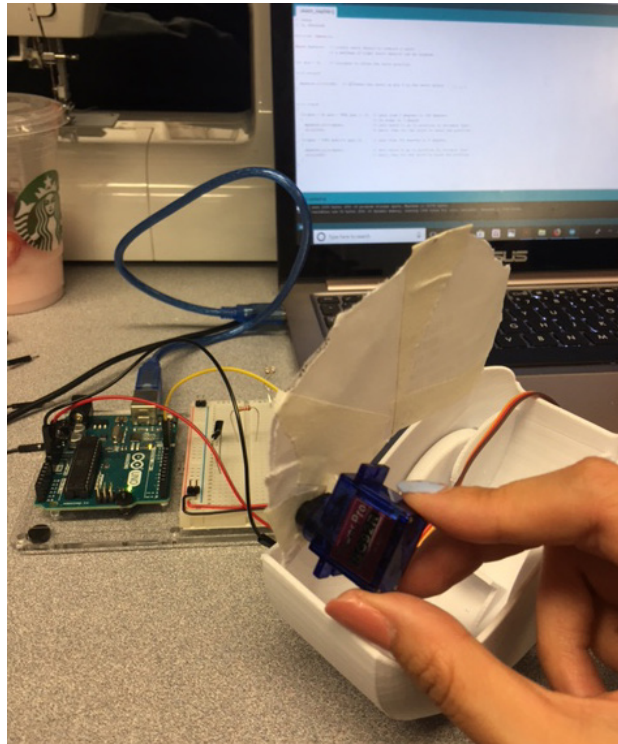


I try to put a motor inside of the car, but the space is not big enough for a motor. As a result, I plan to 3d print a larger size prototype and change the direction of the motor. However, this didn't work out perfectly. Later on, I found a new solution and decided to use a mini servo to lift the wheel. I think to make the wheel extension and hidable is cooler than just turning. So I decided to use a mini servo instead of a motor.

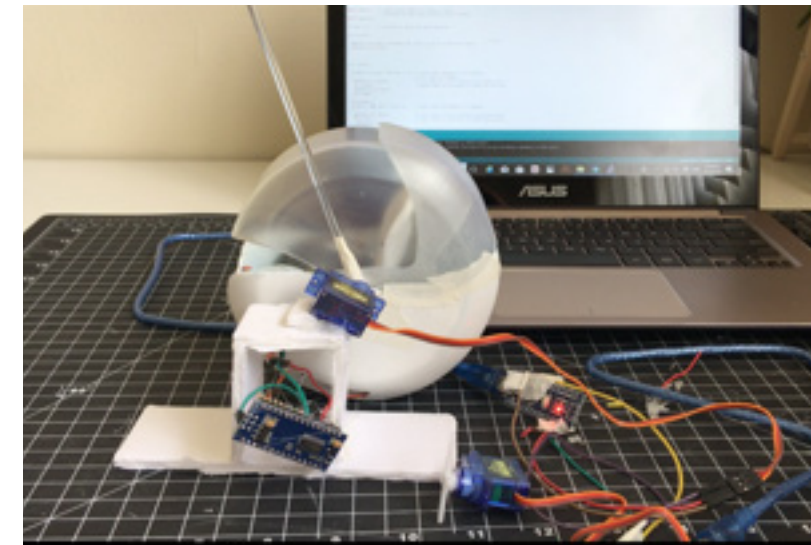




## Window-Mini Servo

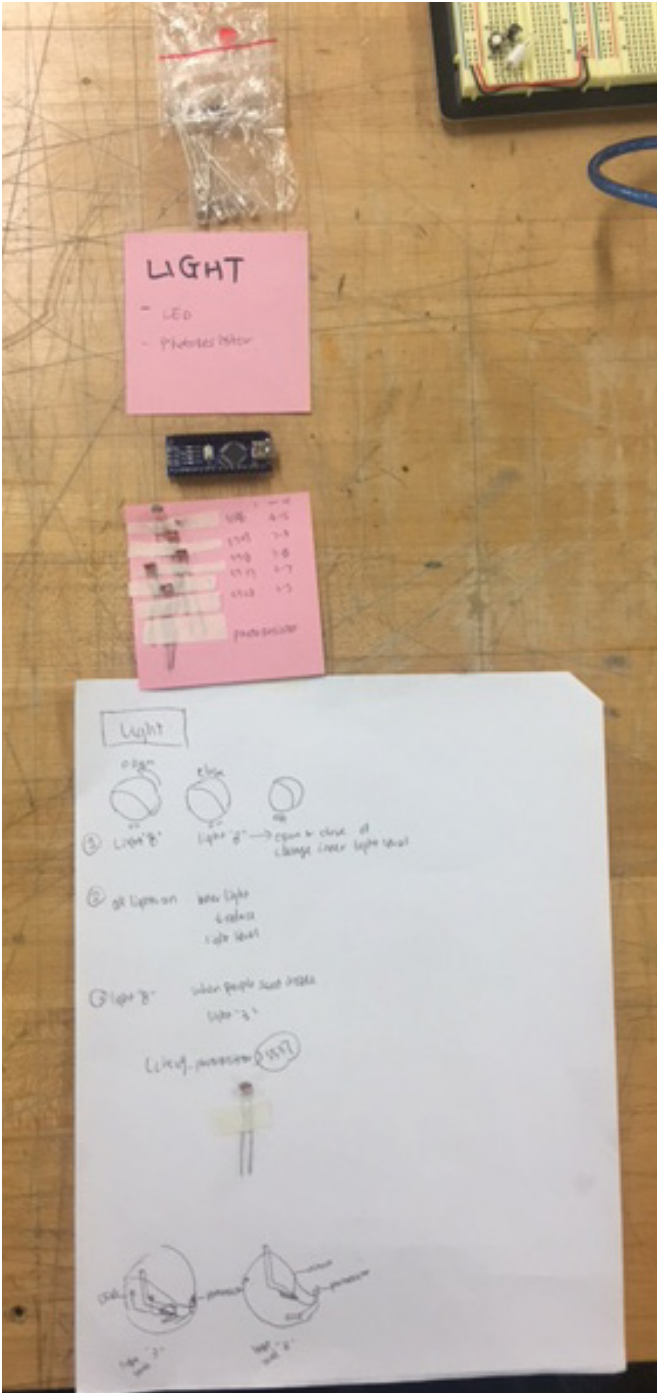
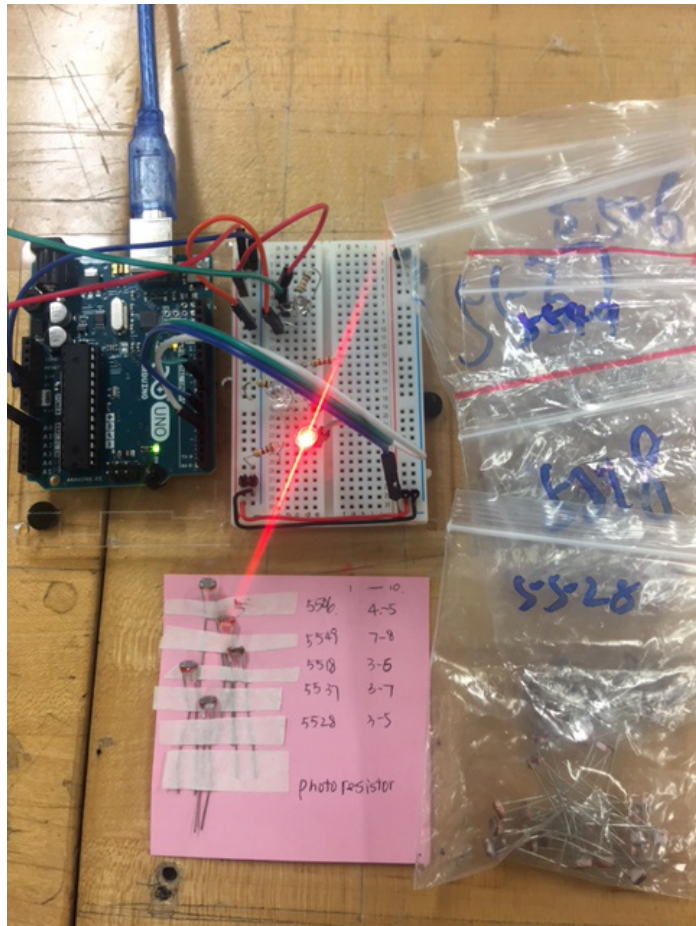


I found that I have to put the servo in the center of the window, but the servo can't fit inside. Boyer told me that I don't have to fit it in, and it helps me a lot. I finally put the servo outside of the mock-up.





# Light- LED & Photoresistor

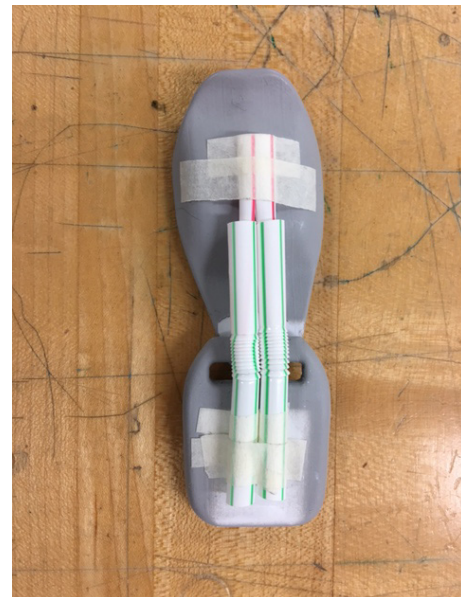


I bought few kinds of the photoresistor and test them for best fit. So when the window open, the light will brighter, and when the window closed, the light will reduce the brightness.

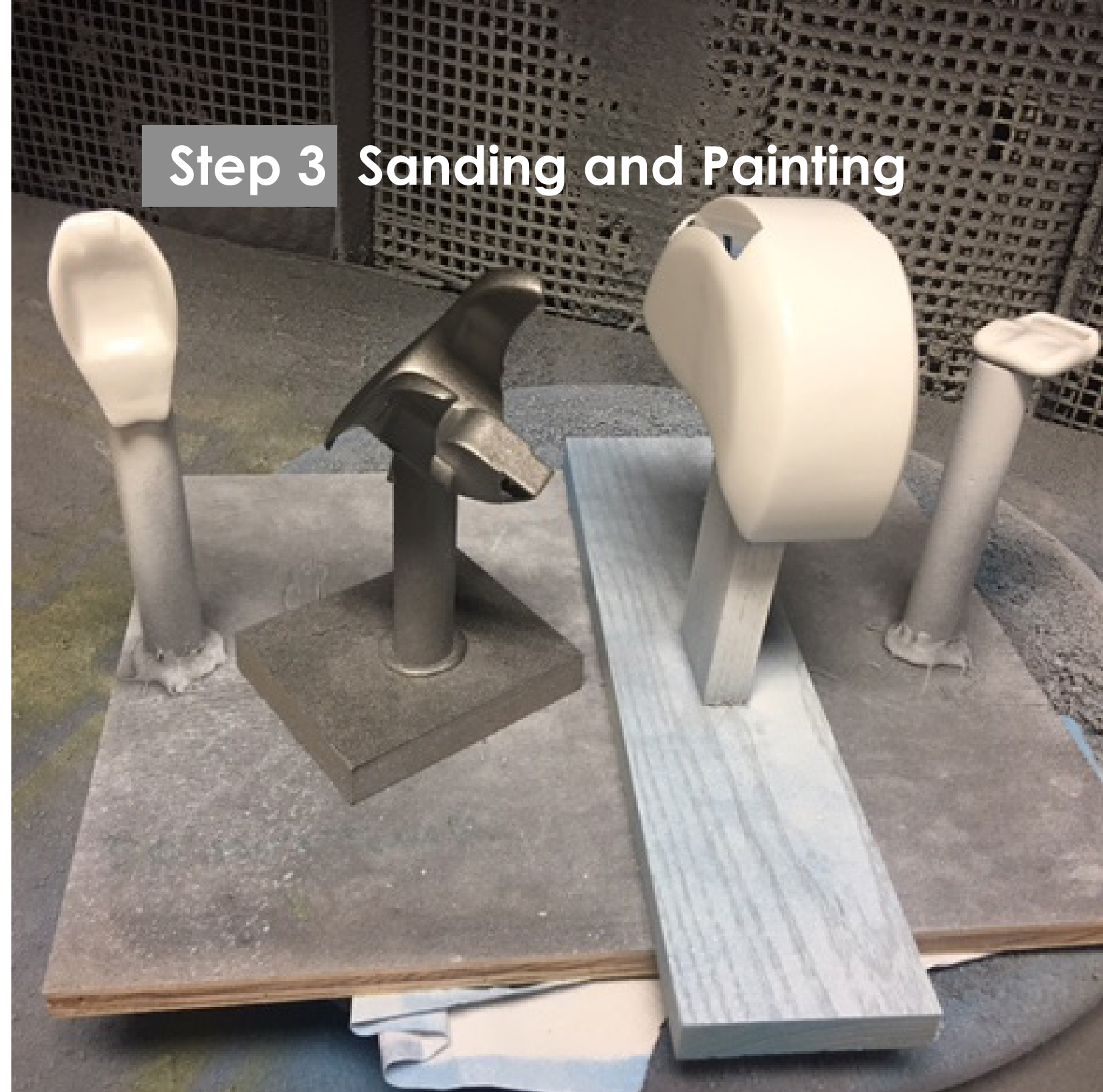


# Chair

An additional feature of this prototype is that I used the mechanical technique to make the chair foldable.

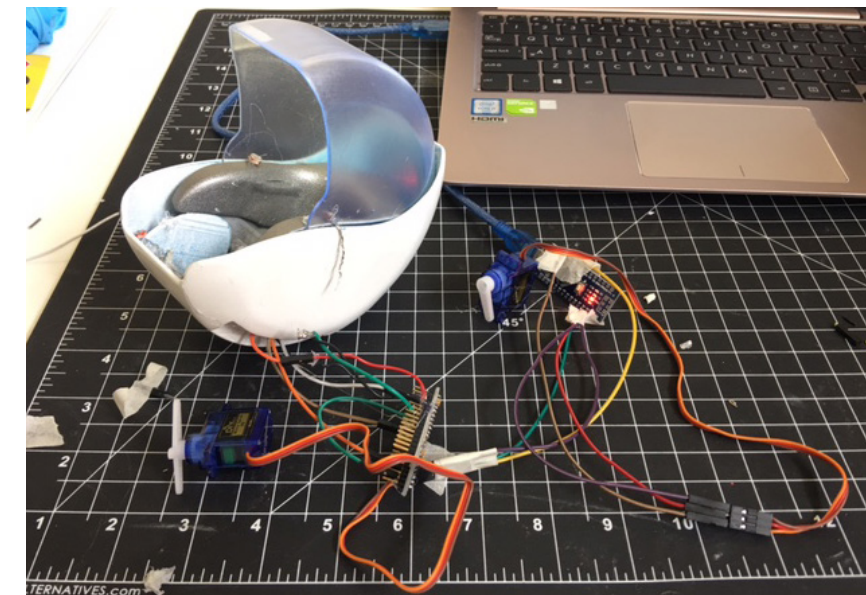
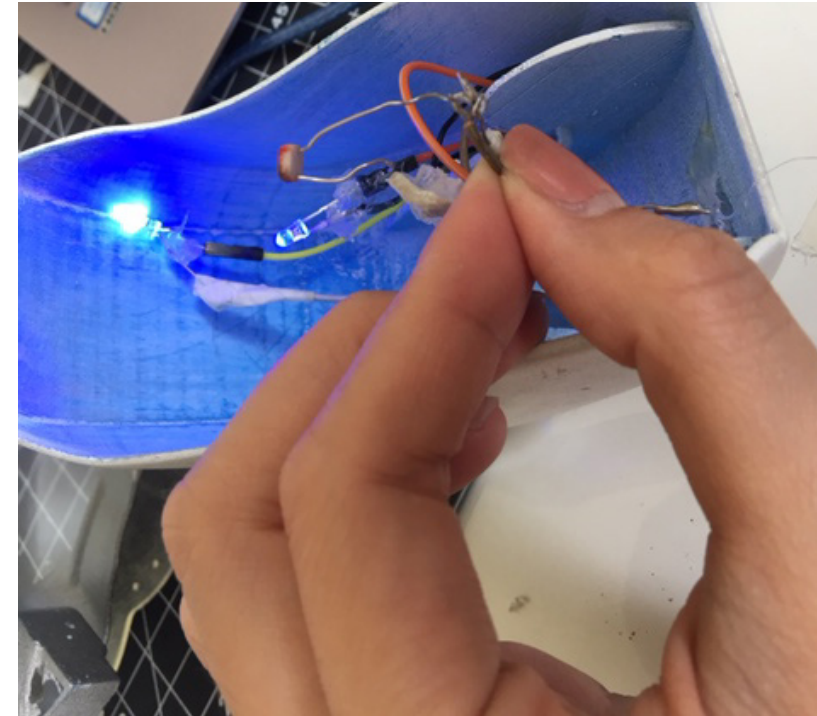
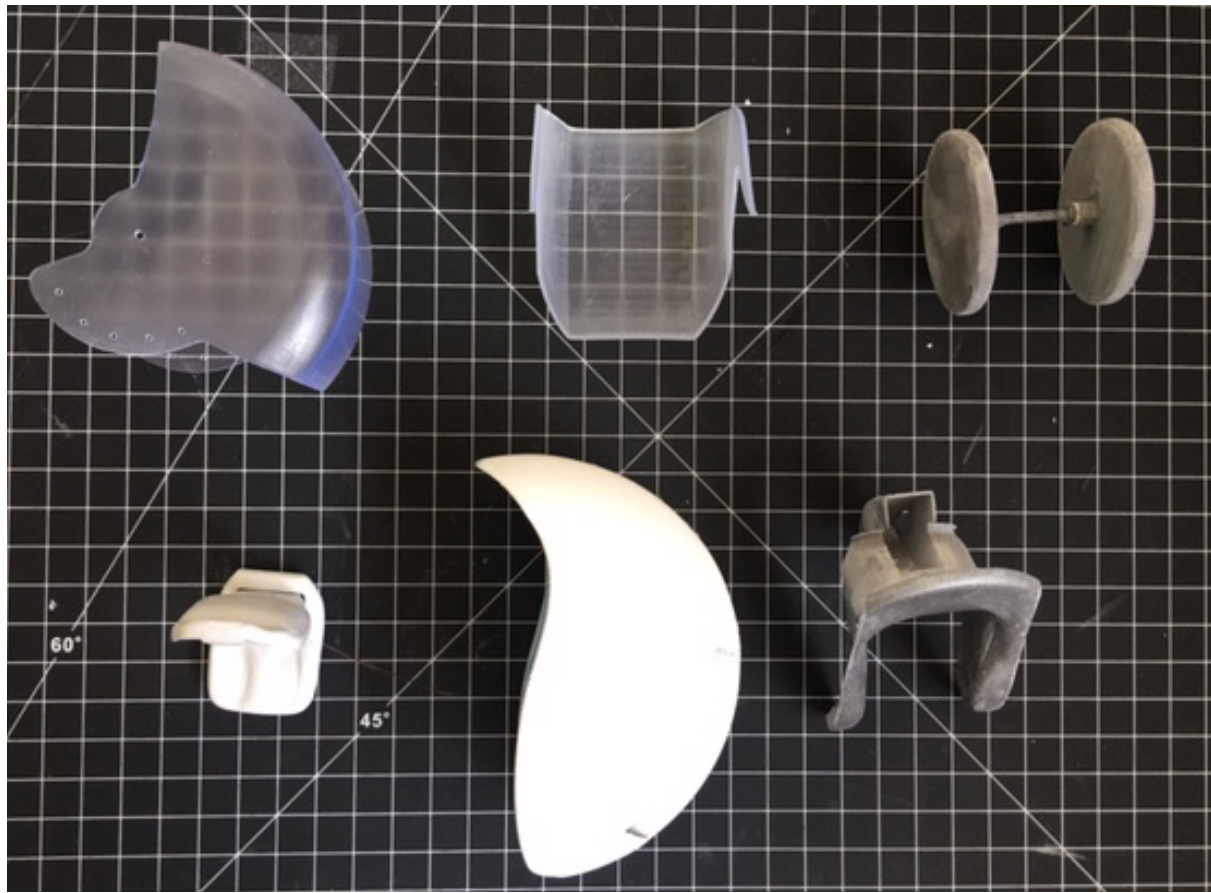


## Step 3 Sanding and Painting





## Step 4 Put all parts together



## Final Product



Please check a 3 mins video from :  
<https://www.youtube.com/watch?v=Gd3bWVXXUyY>





**CHA-CHA**  
Rocking Car  
**Thank you :)**

