Project 4 Das Auto

Team L

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INITIAL PROBLEM DEFINITION

What is this project about?

VW's automobiles are known for their state of the art Engineering. As we move towards an era of self-driving cars, VW needs much more than well engineered, high performing vehicles. Tomorrow's cars need to be human-centred and must change the way they are perceived by us today. We set out on our aim to explore all the new opportunities a self-driving car can open up. Some of the things that we look at are – ***What can people do when they travel in a self driving car, What are the new ways in which people could be seated in a car?*** and more.

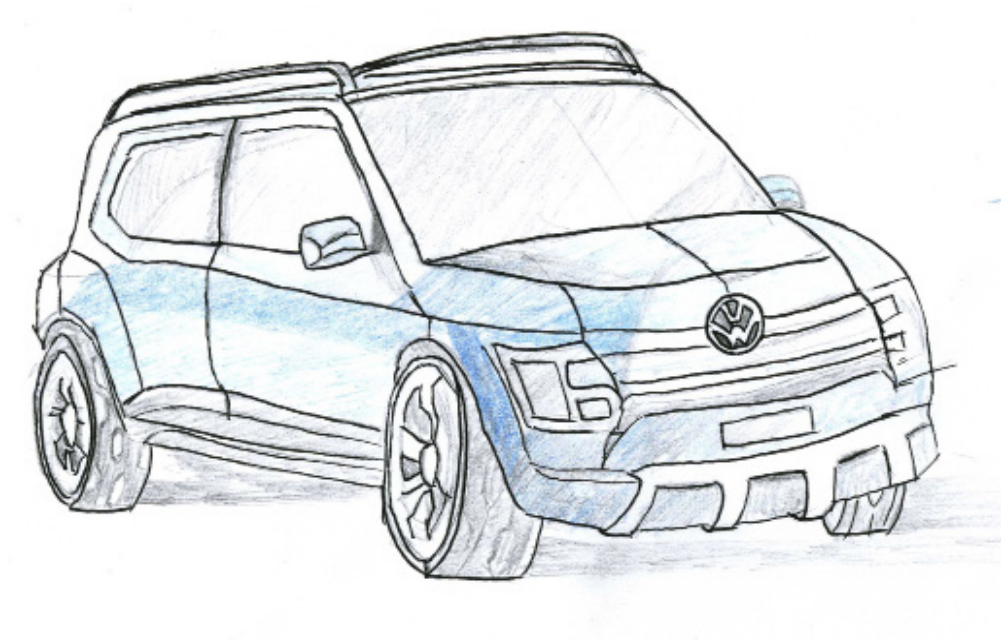
SOLUTION

Core: Help people communicate with each other in natural ways.

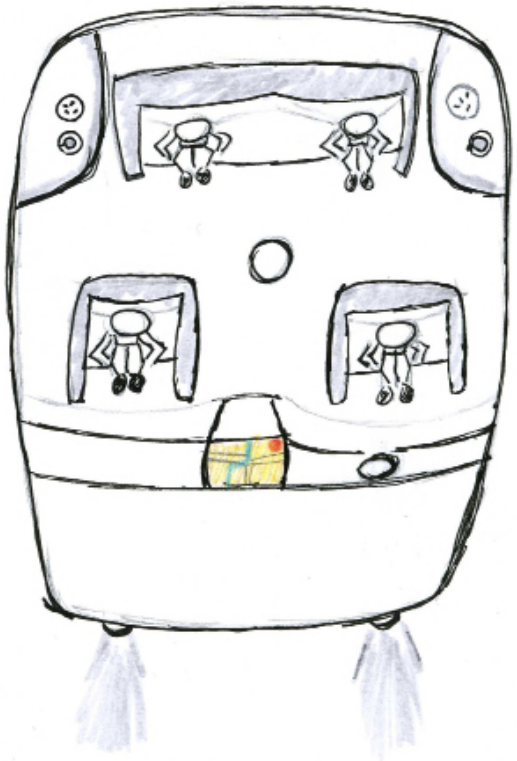
Seats in today's cars are inflexible and it's not convenient for people to communicate naturally in that way. We are proposing a new seating layout for the self-driving car. Since the person doesn't need to pay attention to the road thanks to self-driving ability, we have an opportunity to change the layout in a way that provides a more natural, spontaneous experience to the users while they are traveling in vehicle. The front seats can swivel and rotate, so when the car is self driving, all passengers can face each other. The new seating position along with a table in the center of the car creates a meeting room / living room atmosphere where people can discuss and collaborate.

Apart from this, we propose a digital display in the front panel of the car. Using a smartphone, a user can broadcast their content on to the screen with a simple tap. For example, presentation slides could be controlled from the smartphone app itself. Such a setup could create a great meeting room experience, right inside a car. The digital display props itself up as and when the user decides to broadcast something to it in the self-driving mode. In the later stages of our product, these displays could even be controlled using simple gestures – A swipe to the left or right could change the slides in a presentation.

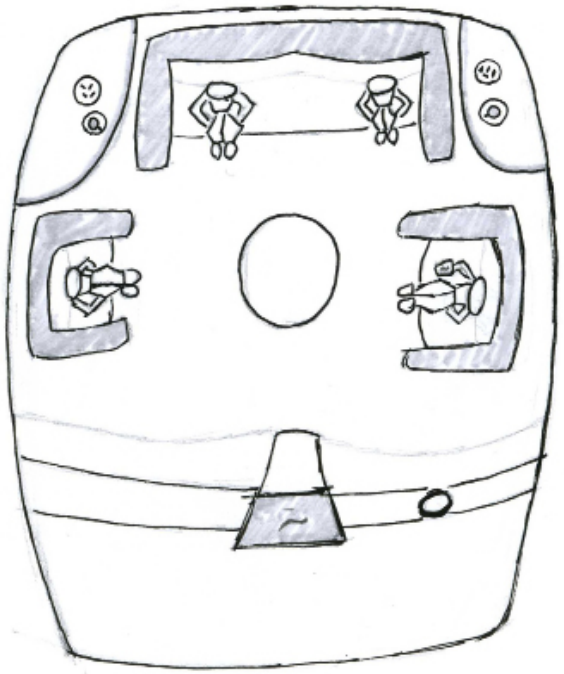
FINAL SKETCH



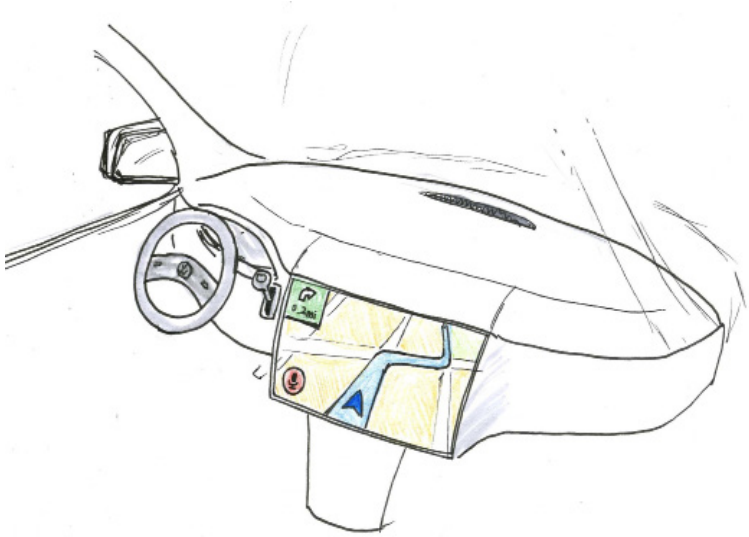
1. The size of the proposed car will be somewhere close to an SUV.



2. When the driver is setting the destination and route for car or manually driving, he or she is seated in the same way as in a normal car.

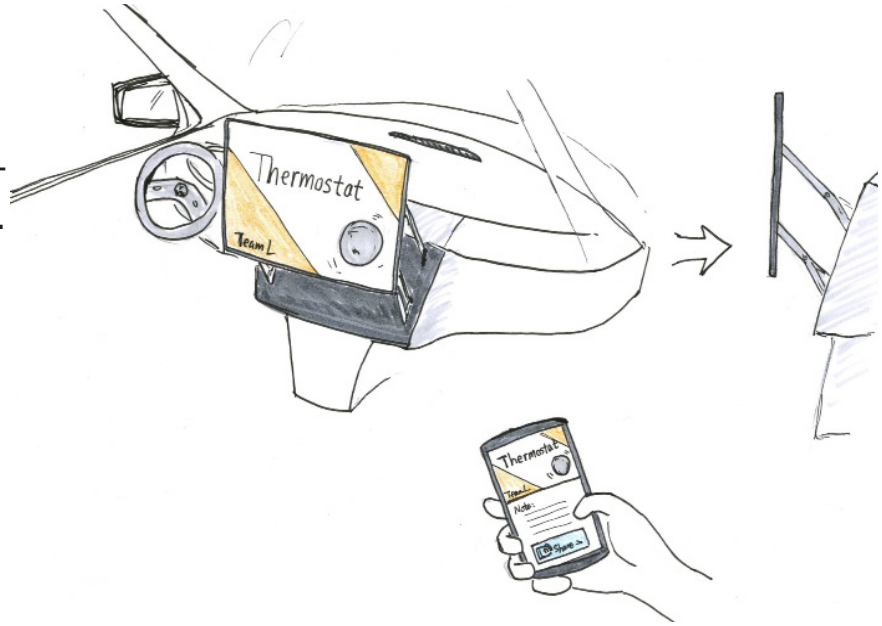


3. When the driver sets the car to self-driving mode, the layout can be changed as shown in the sketch to the right. In this situation, drivers and passengers can communicate with each other in a much more convenient manner, for the driver doesn't need to take care of the car or turn her head back to talk to others, such a necessity arises.



4. The car's front layout is based on the past. The steering wheel is set for manual driving. The car can shift to self-driving mode. In the middle, there is a touch screen with voice control. The screen is the control hub for the whole car, such as playing the music, watch movies, present some documents, slides and so on.

5. The display in the front can prop itself up for easier viewing by all passengers in the car. As shown in the sketch, the user can share their screen with this central display.



6. Passengers could do some basic gestures to control the system in the dashboard. For example, users could use swipe left or right gestures to change the slides during the meeting.

RATIONALE

Most people have this experience: You're traveling with your friends or colleagues and communicating with each other in the car is not as easy as a hangout in a coffee shop. The biggest problem that hinders communication between people in a car is the layout of contemporary cars. People who sit in the front row(including the driver) can hardly see the faces who sit in the back, and vice versa. Research has shown that more than 55 percent of the entire communication spectrum is nonverbal. During communication, things like the body language and even subtle gestures matter, which get lost due to today's layout of cars. We are aiming to change that through our proposed layout.

The large display panel in the car's dashboard enables new and interesting ways of sharing content with others. What is more, drivers and passengers can use simple gestures and voice to control the multimedia system in the car. This natural way will be helpful to improve the experience when communicating with others in cars. Passengers can share a wonderful movie, a beautiful song, a presentation or even an interesting game. The possibilities are endless.

BIG IDEA

Future and Beyond

Our car is not just about a change in layout and simple presentation features. While those are extremely powerful and change the dynamics of the experience of traveling in a car, there are many more imaginative ways in which we could improve the travel experience. The primary aim of our car is to improve the way in which people communicate and collaborate with each other inside the car. While today we use digital screen and smartphones to create a holistic experience, in the far future, this system will include a virtual reality environment through a combination of holographic displays and touchless gestures. The interiors of the car will be bathed in context-based environments. Anything from a simple meeting to a multiplayer gaming experience could be possible. The car of the future will be totally different from what we have today.

STRATEGY

Self-driving cars are still new to people. While we have a good solution at hand, it's important to roll out the minimal viable product now and release the other parts of our solution in a sequential manner. Here's a roadmap below:

30%	**Screen sharing ability through in-car wifi and control from smartphone.** Based on the technology now, we can achieve it. Considering the various other intricacies and technology involved in the self-driving car, we believe that this would make for a minimal viable product in the first stage.
60%	**Change in layout.** Changing the layout is a major step going forward, hence it can be implemented at a point when people are much more comfortable and develop a real trust with the self-driving car. The car's design needs to manage space more efficiently in order to accommodate the new layout without adding too much overhead or footprint.

100%

Touchless gestures. We believe that touchless gestures can open up new ways of interacting with the system. It's also a much more natural way of interaction. Even though this technology is already implementable, it would take a few years to bring them to mainstream automobiles.

APPENDIX I RESEARCH

Videos

Self-Driving Car Test: Steve Mahan
https://www.youtube.com/watch?v=cdgQpa1pUUE

Why Google's new self-driving cars could be the safest on the road
https://www.youtube.com/watch?v=aqrttLPjv1E

Inside Scoop - Why Google is doubling down on self-driving cars
https://www.youtube.com/watch?v=Oe89edqrU9Q

Audi RS 7 concept taken to the limit with no driver
https://www.youtube.com/watch?v=eOYsI1cqUrw

Google self-driving car channel
https://www.youtube.com/channel/UCCLyNDhxwpqNe3UeEmGHI8g

Audi's automated driving in traffic jams
https://www.youtube.com/watch?v=Qa_ZSRj0WM0

2014 Rinspeed XchangE Concept
http://www.topspeed.com/cars/rinspeed/2014-rinspeed-xchange-concept-ar161594.html

Volkswagen Urban Mobility 2030
https://www.youtube.com/watch?v=7PXAccKprBA

E-mobility redefined: The AKKA
https://www.youtube.com/watch?v=KTJa6-b1wf4

Smart highway
http://www.smarthighway.net

Articles

Are we ready for self-driving cars?
http://www.kpmg.com/US/en/IssuesAndInsights/ArticlesPublications/Documents/self-driving-cars-are-we-ready.pdf

Smart cruise control eliminates traffic jams
http://www.ur.umich.edu/0304/July19_04/19.shtml

Toyota: Automated Cars Won't Be Driverless Cars
http://detroit.cbslocal.com/2014/09/04/toyota-automated-cars-wont-be-driverless-cars/

PERSONAS

Jon Pierce

Age: 26
City: San Francisco
Position: Software Engineer

Jon just graduated from UCLA and now works in a leading tech company in downtown San Francisco. He lives in an apartment with one of his coworkers, Sam, far away from their workplace, due to the overpriced rent which he cannot afford now. It's frustrating in the mornings as they has to drive through traffic to their company. Sometimes Jon and Sam need to prepare their presentation before they arrive company, they tried do that during the commute, but it seems impossible for them because one of them should concentrate on the traffic. Due to the stressful experience about commute every day in SF, Jon found that he cannot focuses on his works before lunch.

Image source: http://img2.timeinc.net/health/images/slides/man-tired-car-400x400.jpg

Moreover, thanks to the rush hour, it always takes him more than 40 mins to get to his company, which normally takes less than 15 mins if no traffic is there. Jon has a girlfriend, Monica, who is studying in Los Angeles. They met and fall in love in UCLA during his Master's program and were living together until Jon graduated. They love each other so much that living in two different cities is killing them. Since moving to SF, Jon drives to LA every Friday to meet his girlfriend and enjoy some time with her, and drives back on Sunday night. The long distance driving makes him very tired when he comes back to work every Monday. Jon tried to ask Monica to drive to SF every two weeks, but she is doing a project with others right now and needs to stay in LA.

Nancy Peterson

Age: 38
City: New York City
Position: Self-employed

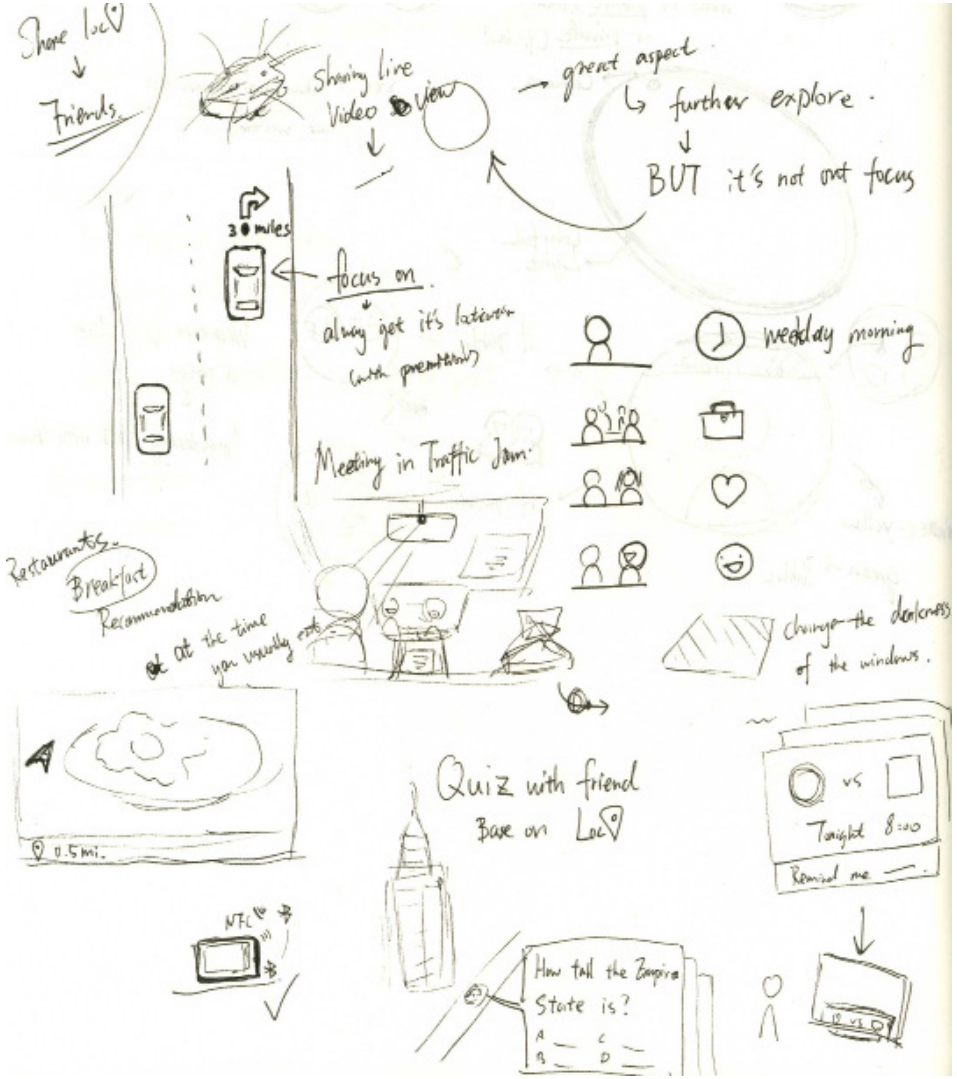
Nancy lives in Brooklyn, NY with her husband Alan and their 3 kids, Bran, James and Lisa. She and Alan own a traveling agency called Peterson Travel services in Manhattan. Every weekday morning, she drops kids off at schools during her commute and picks them up in afternoon. It always takes her more than 2 hours driving and being stuck in traffic jams. She prefers to share more time with her children and enjoy listening to their stories. However, she needs to focus on the road and traffic for safe driving, which makes her stressful and can't focus on her kid's stories. Sometimes, Lisa complains that she doesn't listening her, or even she doesn't care about her stories, which make Nancy frustrating and hurtful. As their company has a wonderful reputation among their clients, Alan and Nancy are always super busy and sometimes they even need to work at weekend. She hopes she could share more time with her children. Alan does his best to ensure that Nancy gets as much time as possible with the kids, but he can't do everything at work without Nancy's help.

GOLDEN QUESTION

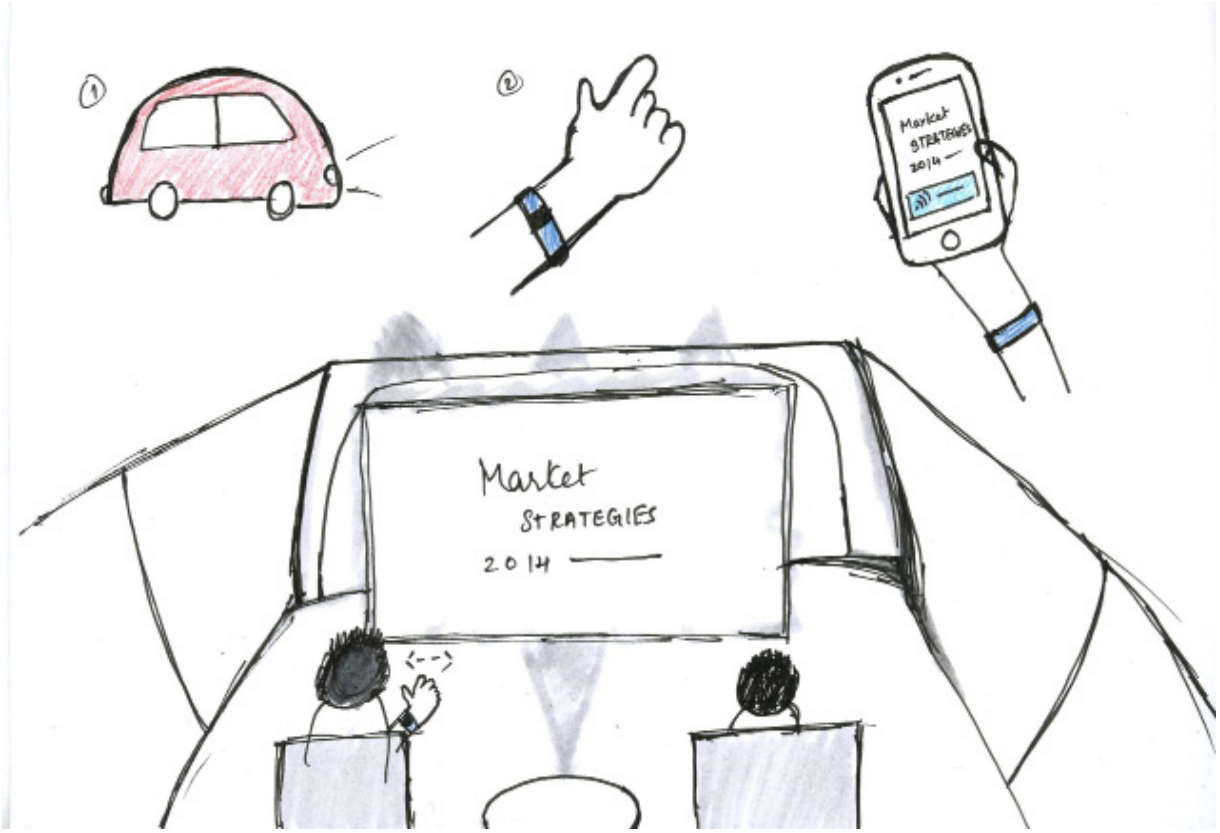
01. Why would people buy an automatic car?
02. What would be the ideal situation in which people use an automatic car?
03. How would they interact with a self-driving car?
    Answer: When my car is going to park itself, it can communicate with other cars to leave more space for it. Volkswagen Urban Mobility 2030, from 5:00 and from 8:00.
04. Can cars communicate with each other?
05. What do they do if the passenger wants to have a dinner?
06. How can users trust such a car?
07. How can the journey in a car be more interesting?
08. Why do people want automatic cars?
09. Can our cars talk to us?
    Answer: May be both literally and figuratively. One, as a smart assistant it could respond to my questions. Two, using subtle indicators and feedback it can help me easily control the system.
10. Why do people have to sit in a specific layout? why not in the middle?
11. Why can't cars be used as a public transport?
12. What do people do when they travel?
    Answer: What about share a drink with another driver during a long and lonely trip? Why not make a friend?
13. Why do people love the feel of a car? How does it matter?
    Answer: People who drive love the way a car makes them feel when driving. The feel of the steering wheel, acceleration, handling etc. gives a satisfaction like no other. But how do we replicate this feeling in self-driving cars?

14. How do we automate cars and have luxury features in it?
    Answer: Different kit will make cars more luxury.
15. What makes a car personal?
    Answer:We can create a “physical API” for automatic cars. E.g. I’d like to drink coffee, so I can buy a coffee machine with specific API to my car.
16. What other information can cars give us other than commute?
17. How many hours nowadays for people staying in cars?
18. Do they need a more comfortable environment?
19. What is a more natural and transparent method to interact with cars?
    Answer: As a driver, I think the wheel and pedals are the natural things or traditional things for me. Gestures could be the most natural way to interact.
20. What causes drivers feel stressed during driving?
21. Is there any universal way to control cars (i.e by all passengers)?
22. What are the different ways to control the car?
22. How can drivers change the mode between Auto / manual?
23. Do self-driving cars could saving more time than normal cars?
24. How to figure out the conflicts between self-driving cars and normal cars on the roads?
25. Does the interaction nowadays between cars and drivers make drivers stressed?

SKETCHES

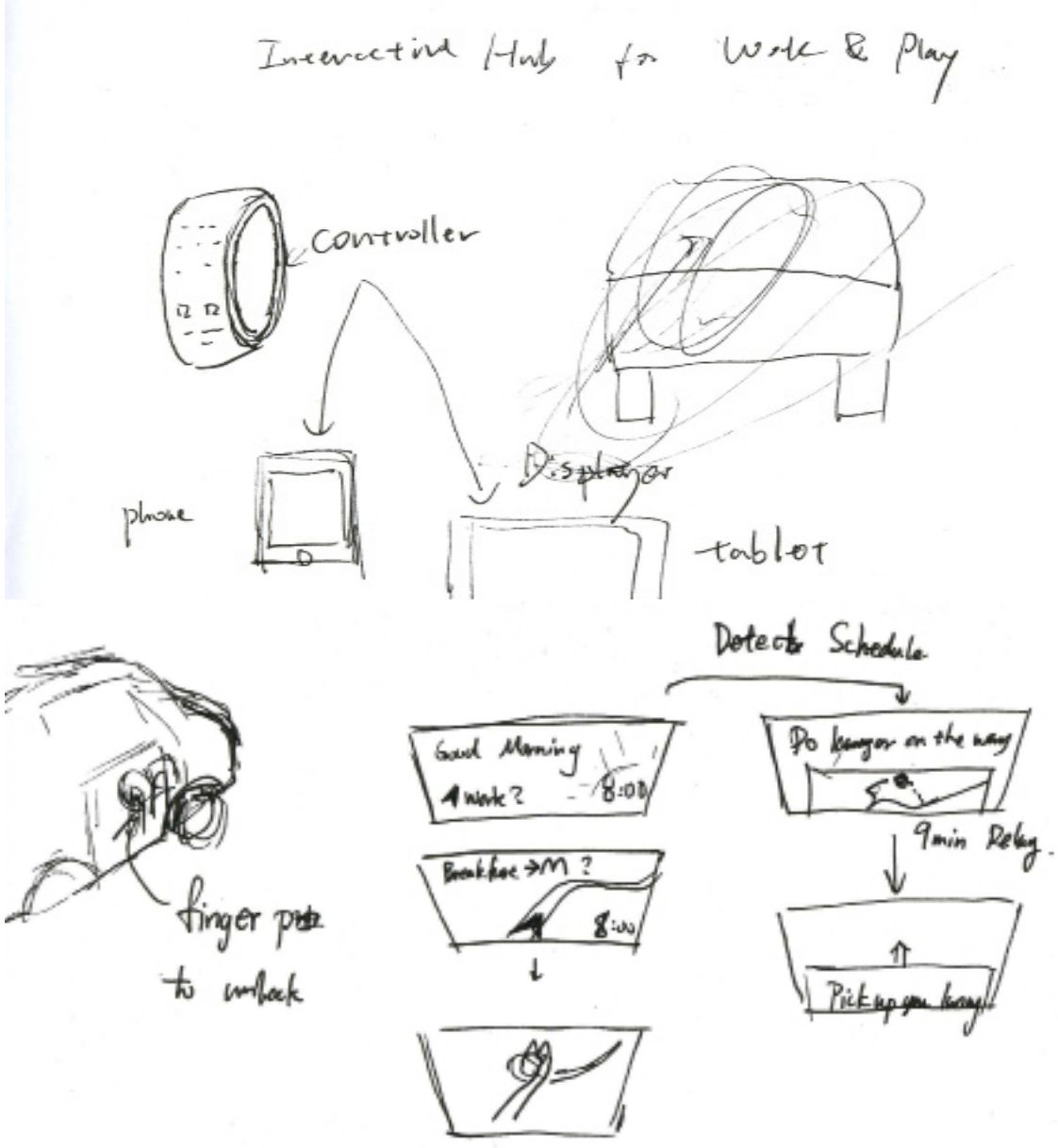


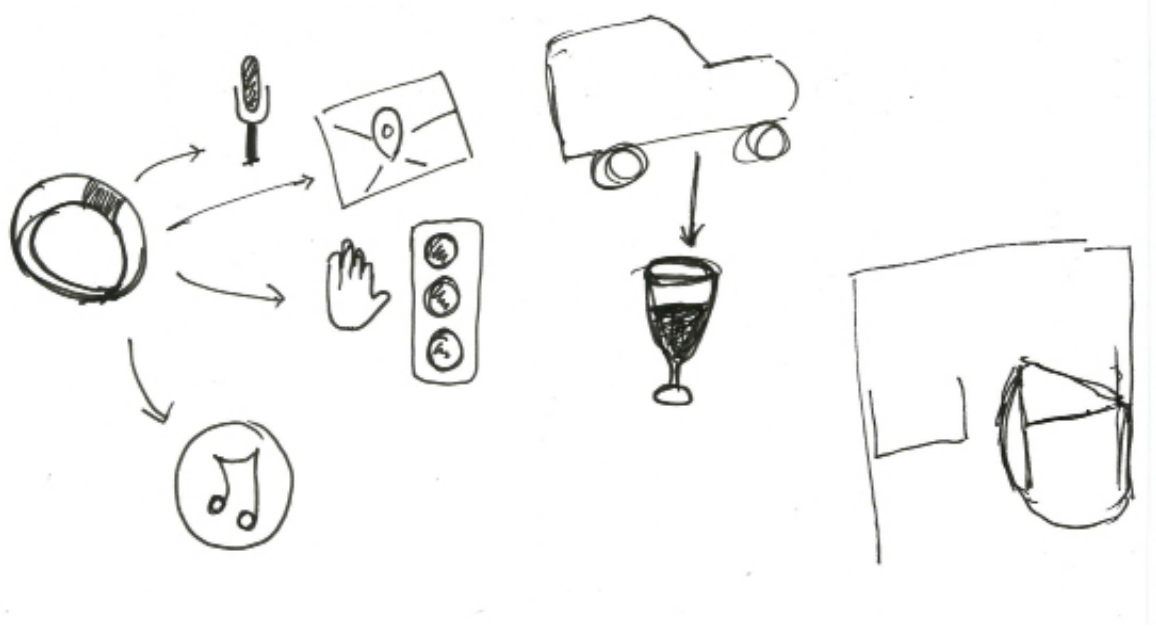
Sketch about the whole system with functions such as different mode, location based game and infomation sharing.

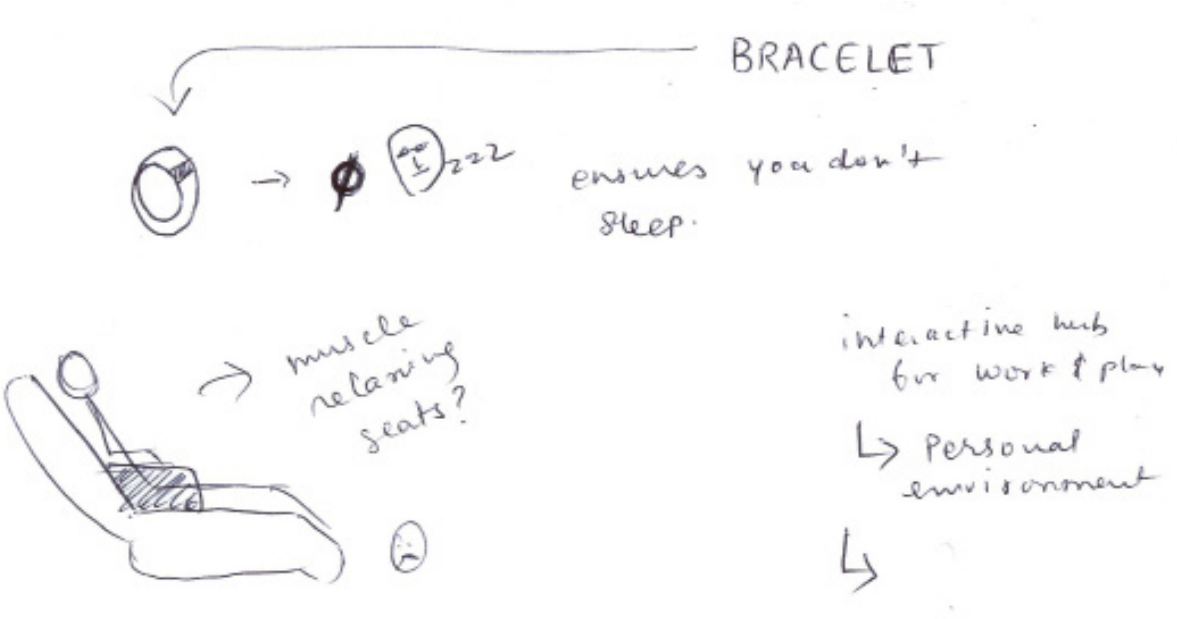


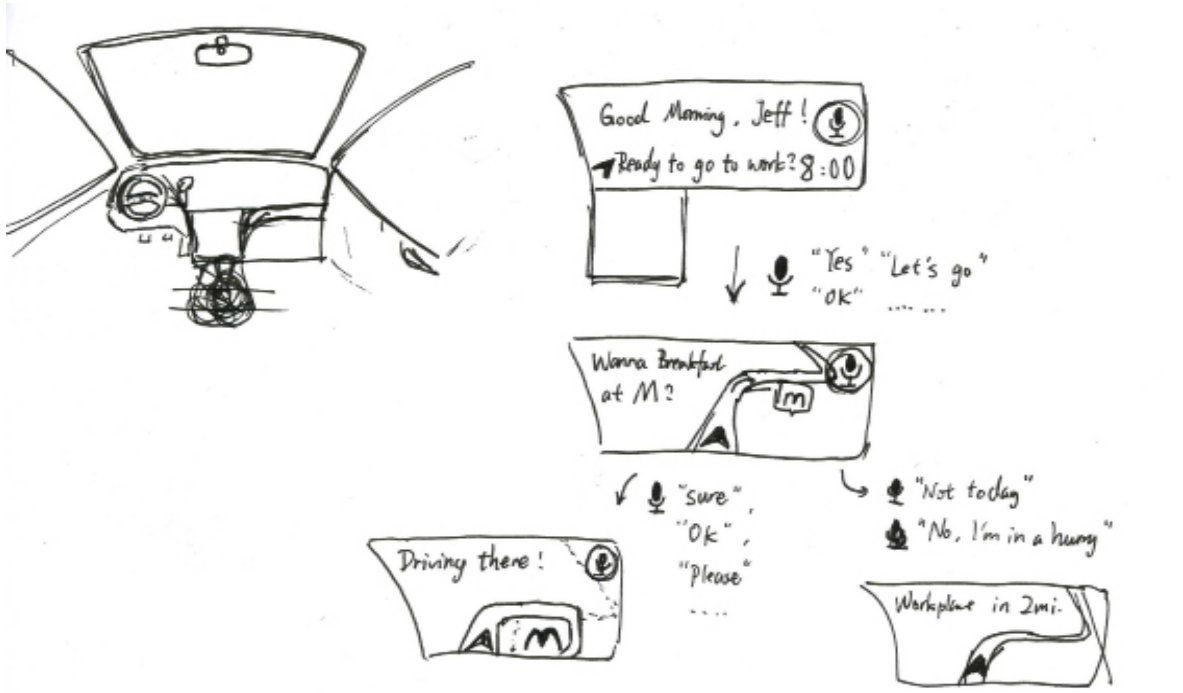
The sketch about self-drivng car's appearance, control bracelet and holographic projector.

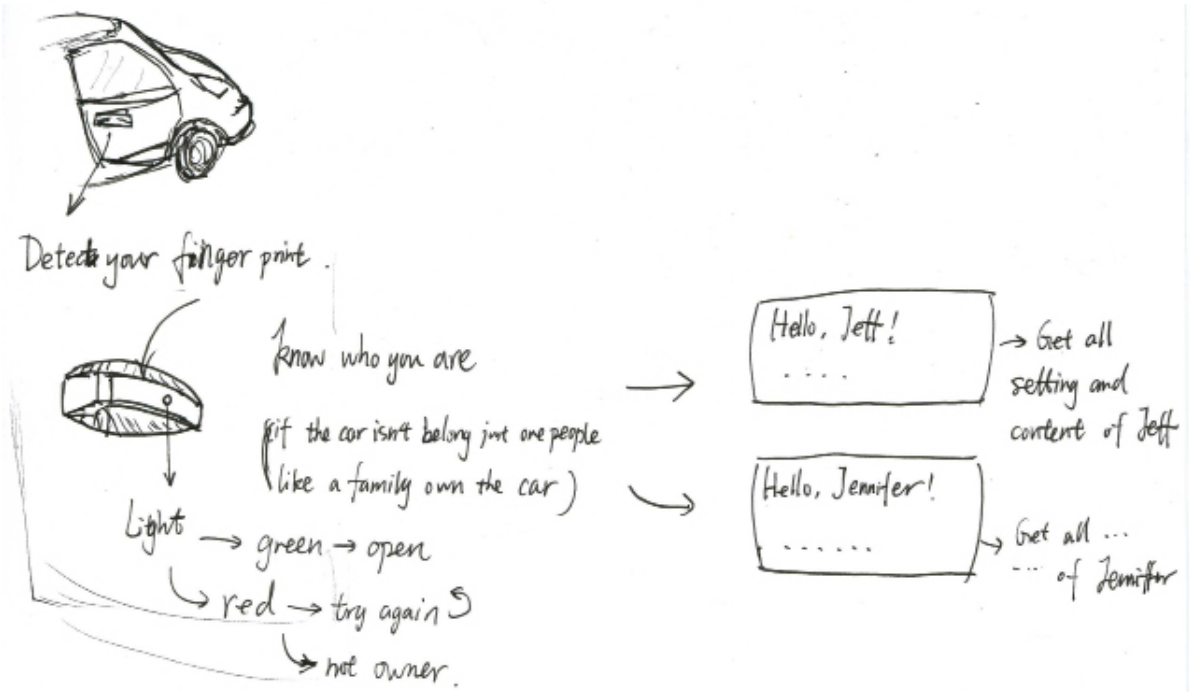
SKETCHES I CONTROL



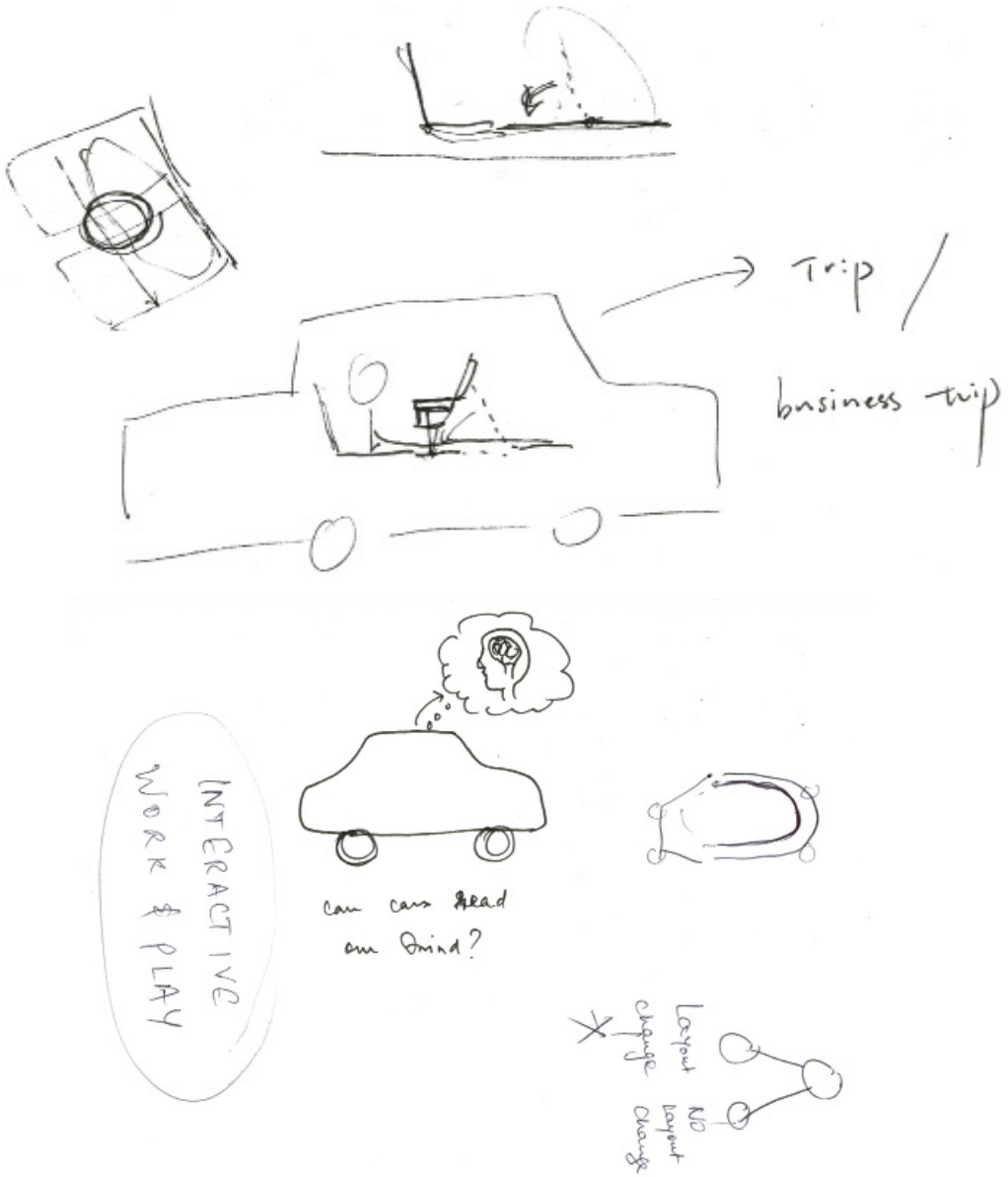


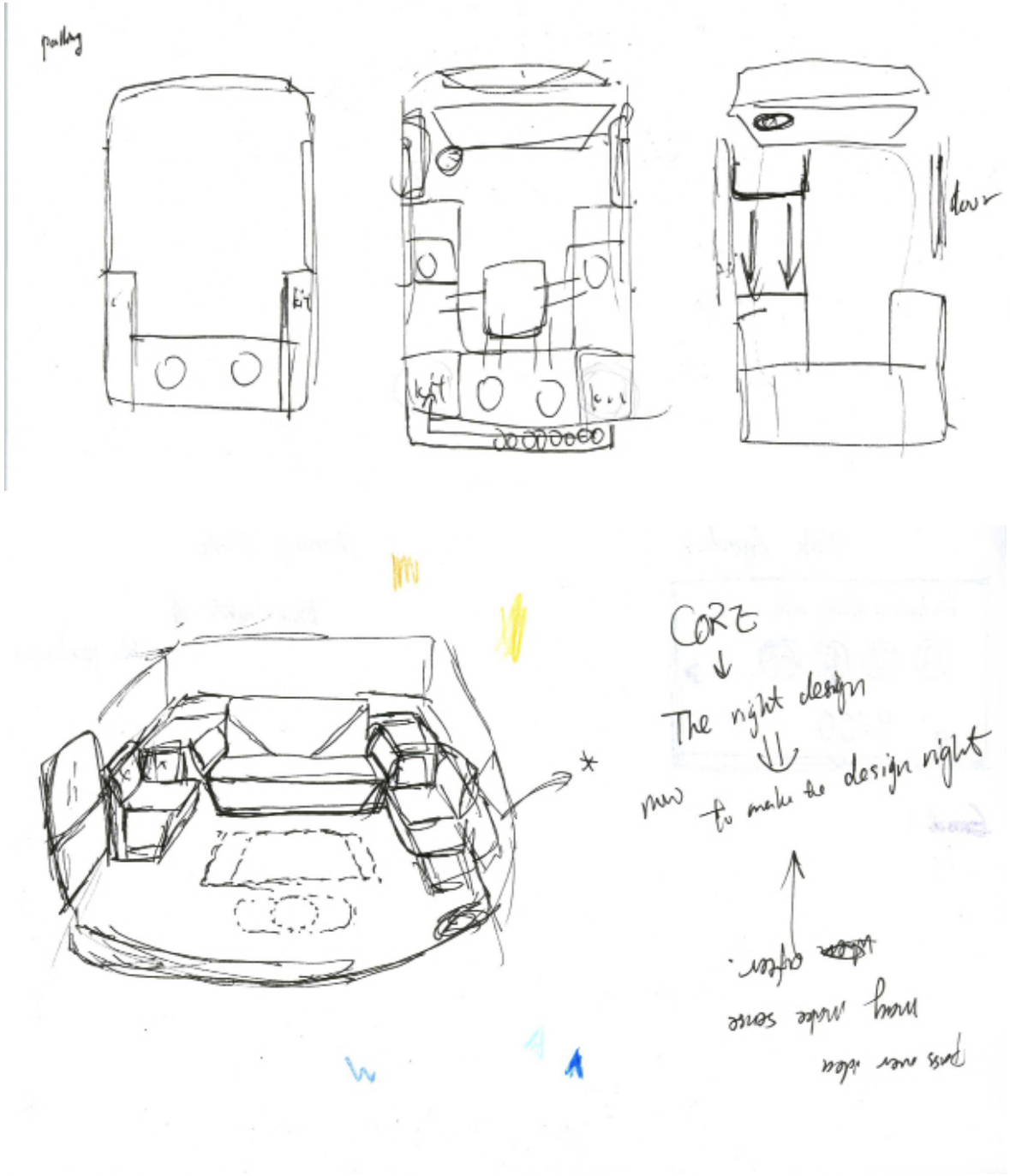

BRACELET
ensures you don't sleep.
muscle relaxing seats?
interactive hub for work & play
Personal environment

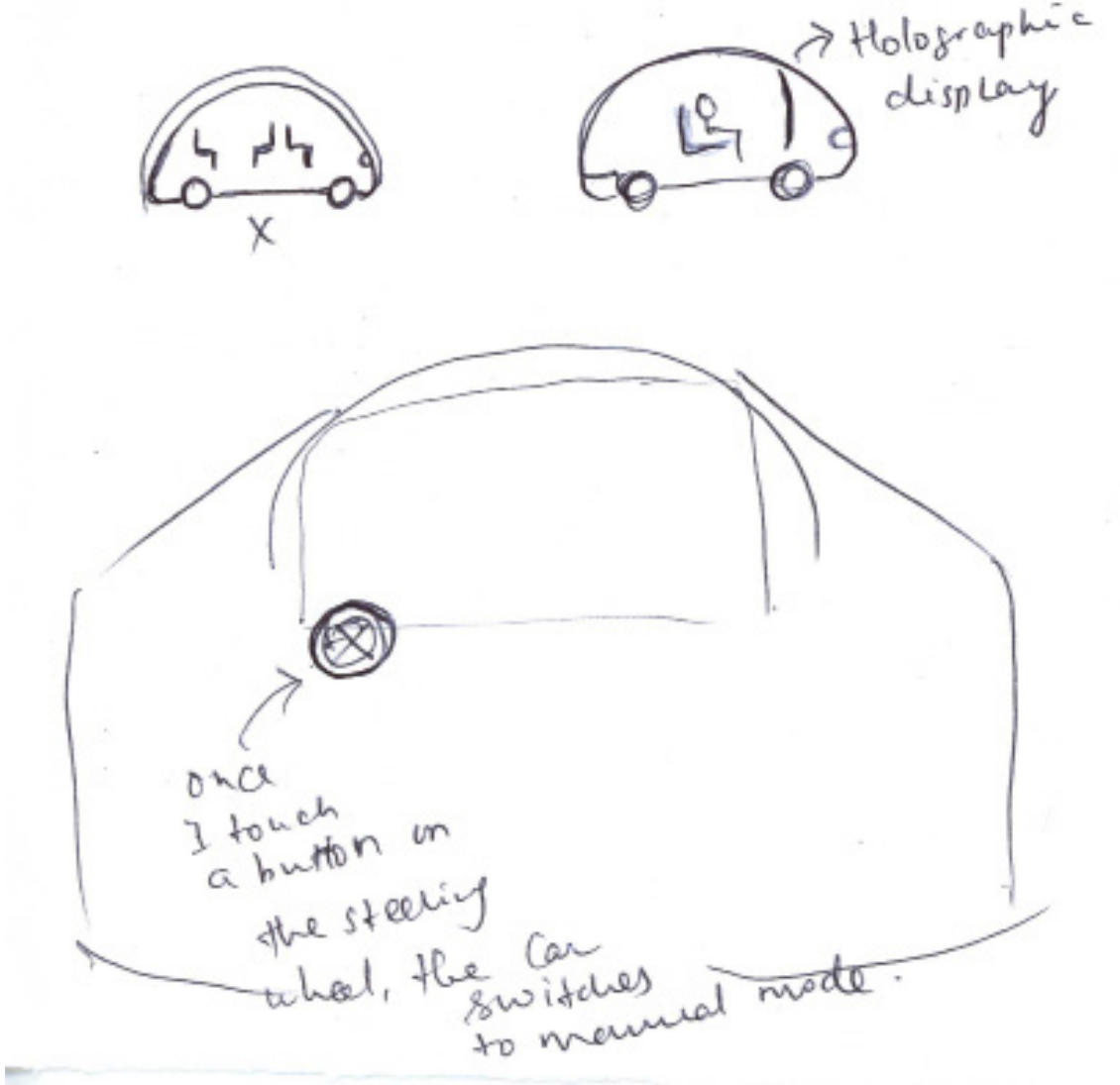

Good Morning, Jeff!
Ready to go to work? 8:00
"Yes" "Let's go"
"Ok" ....
Wanna Breakfast at M?
"sure",
"Ok",
"Please"
....
"Not today"
"No, I'm in a hurry"
Driving there!
Workplace in 2mi.


Detect your finger print.
know who you are
(if the car isn't belong just one people
like a family own the car)
Light → green → open
→ red → try again 5
→ not owner.
Hello, Jeff!
....
→ Get all setting and content of Jeff
Hello, Jennifer!
.....
→ Get all ... of Jennifer

SKETCHES I LAYOUT

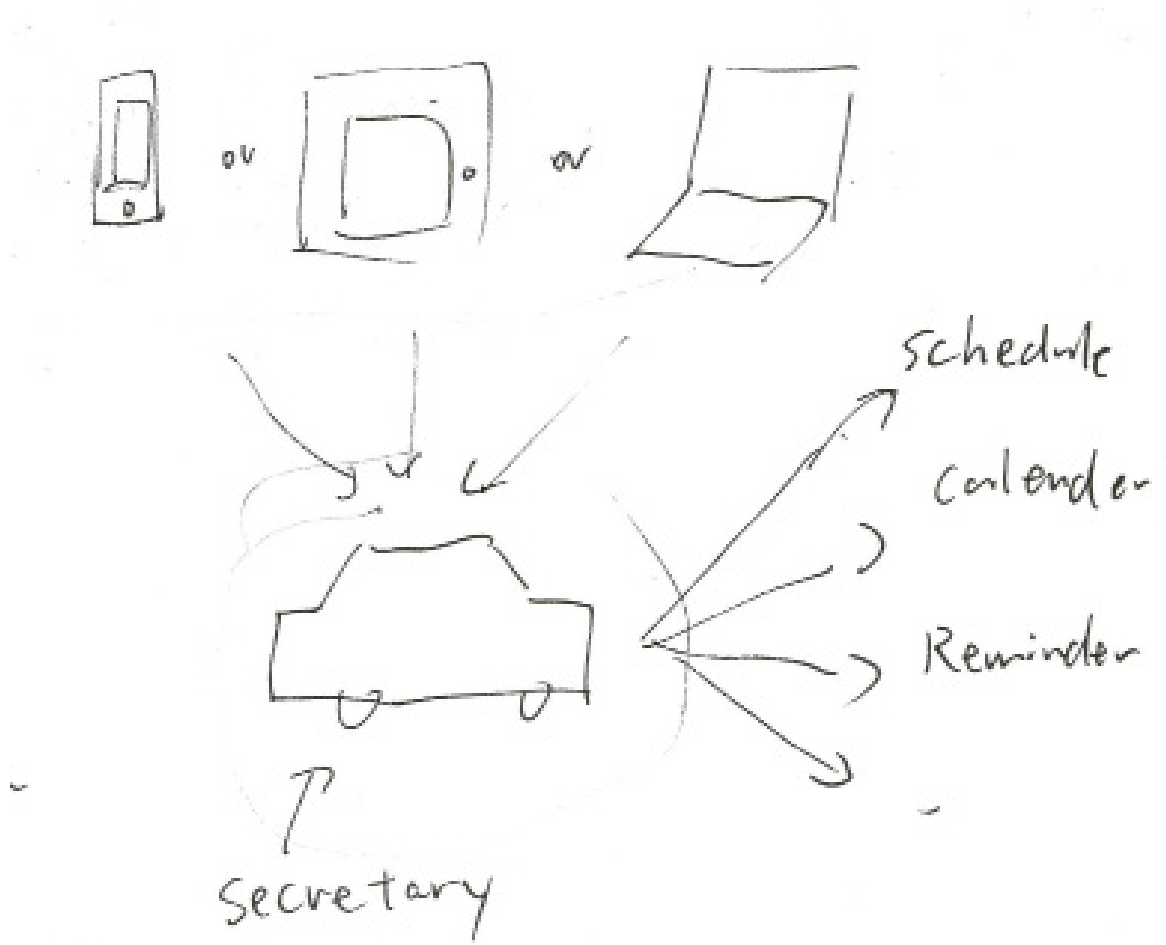



CORE
The right design
to make the design right


Holographic display
X
once I touch a button on the steering wheel, the car switches to manual mode.

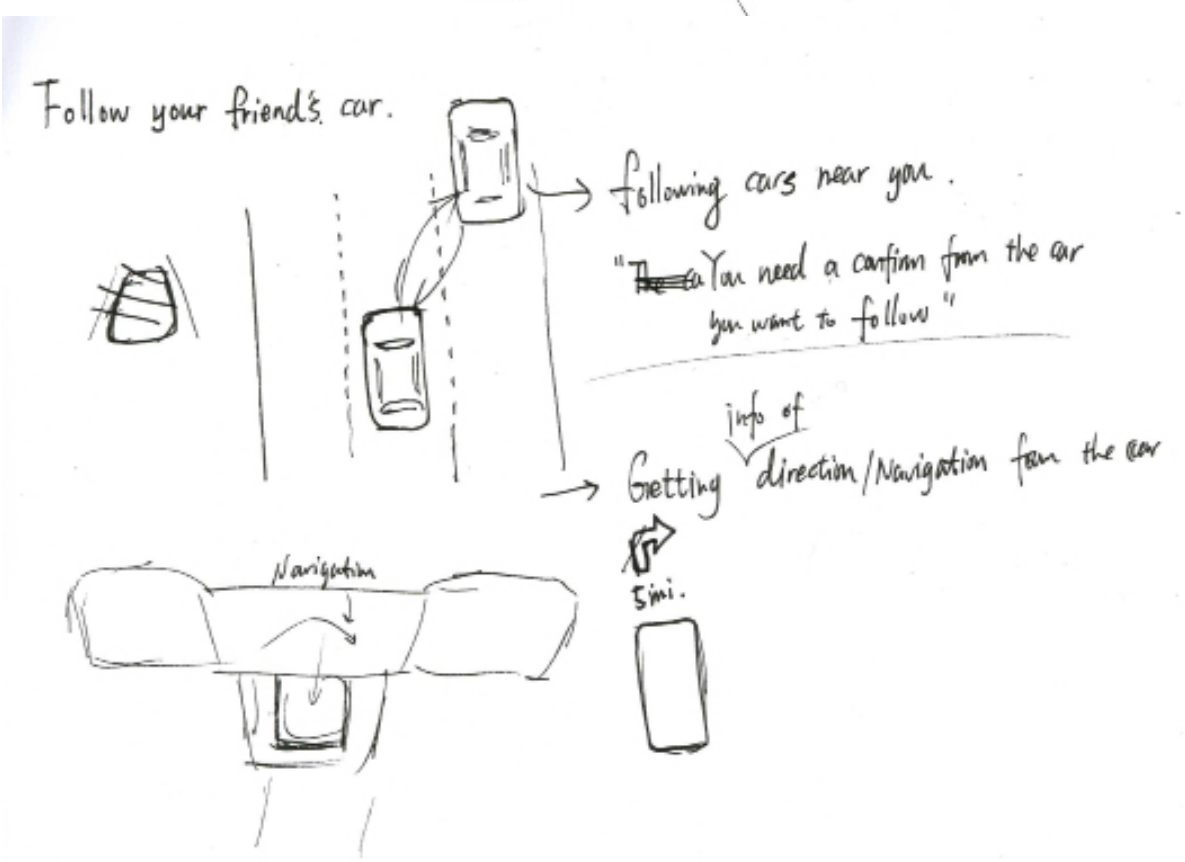
SKETCHES I KIT

SKETCHES I CONNECT



SKETCHES I FEATURES


Oct 30
Happy Wedding
XXXXXX


Follow your friend's car.
following cars near you.
"~~The~~ a You need a confirm from the car you want to follow"
Getting info of direction/Navigation from the car
Navigation
Simi.

SPECIAL THANKS

All of Team L would also like to thank Denique for volunteering her time and helping to guide us through this process.