

# FIFTY FIFTY

*Redefining Domesticity*

Ziying Qiao

RISD MID 2020

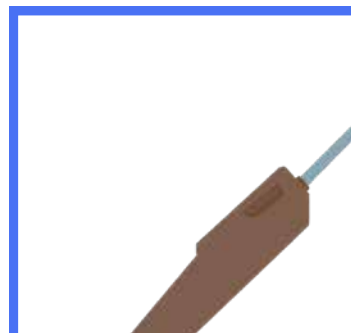
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#01 Molly



Object:  
Vacuum  
Duration:  
12 minutes



#02 Fraser



Object:  
Steam Iron  
Ironing Board

Duration:  
23 minutes



# FIFTY FIFTY

## *Redefining Domesticity*

A thesis presented in partial fulfillment of the requirements for the degree Master of Industrial Design in the Department of Industrial Design of the Rhode Island School of Design, Providence, Rhode Island.

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2020

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# *Abstract*

I want to redefine domesticity and challenge traditional gender roles by rethinking the division of domestic chores.

In this project, I discussed gender roles, especially for how the house design impacts gender inequality and the perfect female figure in traditional context— good mother, good wife. In the experiment part, I explored the possibility of collaborative housework and designed different objects related to daily life to remind people of the importance of collaboration.

For the final design part, I applied surveillance camera and machine learning technology to a private space, designed a radical service about chores, and also discussed how people react to Foucault's idea about Panopticon.

Few tasks are more like *the torture of Sisyphus* than housework, with its *endless repetition*: the clean becomes soiled, the soiled is made clean, over and over, day after day.<sup>1</sup>

Simone de Beauvoir

It was really a performance about  
*complete and total trust.*<sup>2</sup>



Marina Abramović and ULAY. Rest Energy. 1980  
moma.org

2. Marina Abramović and ULAY. Rest Energy. 1980 | MoMA.  
(n.d.). Retrieved from <https://www.moma.org/audio/play-list/243/3120>

# Introduction

## One: cage

When I was a little girl, I enjoyed playing with friends, we caught bugs and played with mud. I did not care about the stains on my clothes or the scars left on my legs after I fall. But one day, I was told, “a girl shouldn’t play with these dirty stuff all day.” Then I had to learn ballet, calligraphy, and drawing. As a kid, I didn’t understand why. I knew I was not too fond of it, but I didn’t fight with it. They wanted me to be a lady, but there was a rebellious soul inside my body.

They made a cage, decorated it with beautiful words, then put us inside in it.

What if they are in the cage?

## Two: domesticity/intimate relationship

Why domesticity?

I want to start with intimate relationships.

What words do we remind when we are talking about the intimate relationship?

Romance. Promises. Roses.

But it can also be chaos, conflict, dirty dishes.

Personally, intimate relationship means to open up part of the private realm, before gaining something, you have to give something.

It is about equality.

*Power*

*In the House*

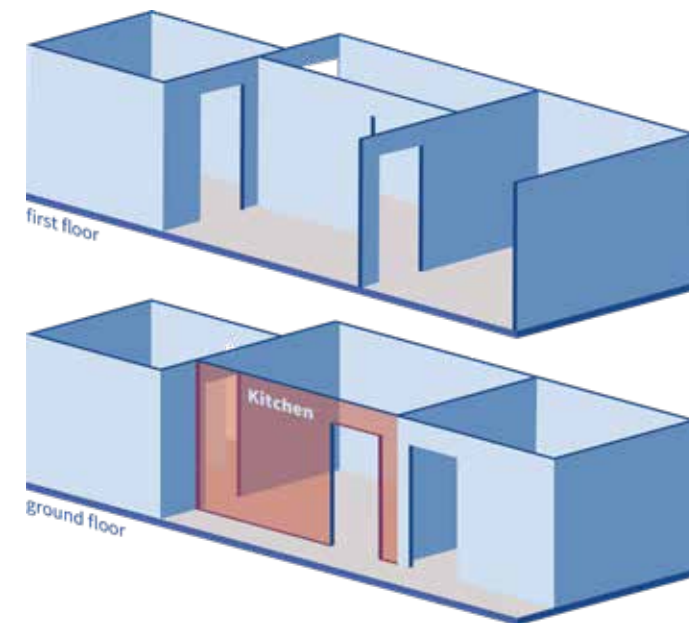


## House and Gender

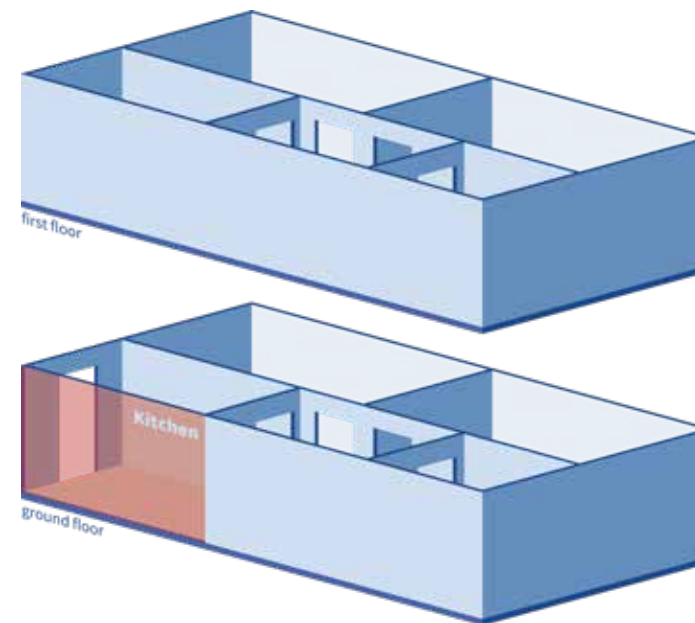
House is a box. It is a container of human activity. What is the relationship between physical construction and social construction of the house? The spatial divisions of home, in a sense, embody assumptions about domestic work, the unity of family life, dignity, and privacy.

From the nineteenth century to the present day, the design of the house has been shown to reify gender divisions. In a sense, women are living in the house as servants. From the by-law house to the semi-detached house, the enclosed kitchen exemplifies this well. Since the kitchen too small to eat in, the family has to sit in a dining room, and then the food would appear magically from another place. The housewife becomes an unseen servant confined to a small room at the back of the house.

But the kitchen should not be considered as the single domain of one family member. The appearance of good vent hoods, well-insulated ovens, and the advent of the microwave makes the kitchen less likely to overheat the rest of the house or fill it with noxious cooking smells. These changes free the kitchen into the house as a whole.



by-law terraced house



semi-detached house

Housing design has been seen too much in terms of the needs of mothers with young children. Further, *the divisions of gender and class status* are formed within housing design, not as a product of it, but as a part of the design process and the building itself.<sup>3</sup>

3.Roberts, Marion. "Gender and housing: the impact of design." Built Environment (1978-) (1990): 257-268.

## Good wife, good mother



Another day in paradise  
Anne Taintor

In Chinese, there is a phrase to describe an ideal female figure in the traditional context, which is “good wife, good mother.” The perfect female should take care of her husband and her children, devotes all her energy to the family.

When people talking about gender equality, there is always a voice. “A large proportion of women are already in the workplace. Why are you still say it is inequality?” The housewives have already be ignored when they use employment rates as a yardstick to measure gender equality. The domestic chore, or unpaid job, is not a real job in their mind.

Even for women who have a job, they are doing more housework than men. Women carry out an overall average of 60% more unpaid work than men, ONS(Office for National Statistics) analysis has shown.<sup>4</sup>

4. Women shoulder the responsibility of 'unpaid work'  
<https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/earningsandworkinghours/articles/womenshouldtheresponsibilityofunpaidwork/2016-11-10>

# Does it change *in 2020?*

To better understand which everyday activities happened in the domestic realm, should I investigate and identify the definition of “good wife, good mom.” I set up three user testings and have twelve participants finished the following tasks.

## Card sorting I

I prepared thirty cards with housework write on, then I give them to the participant. Ask the user to look at the cards and sort cards to three categories:

- What kinds of housework dose your mother often do?
- What kinds of housework dose your father often do?
- What kinds of housework do your parents often do together?

## Card sorting II

Ask the user to look at the thirty cards and sort cards to three categories:

- What kinds of housework would you like to do it by yourself?
- What kinds of housework do you hate to do?
- What kinds of housework do you want someone to help you to do?

## Checklist

Make a “good mom” checklist.

Based on the results, I interviewed the participants and got the following responses.

*“Compare to cooking, washing dishes is boring, it lacks a sense of achievement. After you spend time on it, you are not really enjoying the result.”*

*“My dad barely does any housework. He’d rather spend more time enjoying a cup of tea. But for me, I would do at least half of the housework.”*

*“Ideally, equal division of labor between couples would make the most sense.”*

*“If it is possible, I hope there is someone who does all the housework...My mother is the one who earns more money, but she still does at least half housework. It is unfair.”*

*“I almost do all the housework, but I enjoy doing it.”*

.....



Another day in paradise  
Anne Taintor

# What if *I was married?*

Ilf my husband refused to do any domestic chores, I do not think we will get married. For this situation, I would imagine he is the only working person in the family, or he shoulders more responsibility to provide financial support to the family. If we were both working people, we should also both do housework. I will communicate this with him, and it would not be a sweet suggestion but a more serious conversation.

For marriage or intimate relationships, in different cultural contexts, the gender roles play differently. For my parents, they will co-educate me but not sharing on general chores. My mother is the person who does most tasks.

But in the US, I guess men are not under pressure on sponse the whole family, so maybe they will have time to do more housework.

Also, I think parents need to make role models teach their children about gender equality, but it is hard to do when they have only had one child.

I do not think domestic chores are originally gendered. Men do not do because they believe they do not have time. But now, men and women both have important things to do. Domestic chores should not be one person’s business.

*Chores*

*In the House*



# Everyday life

## Moments in the house

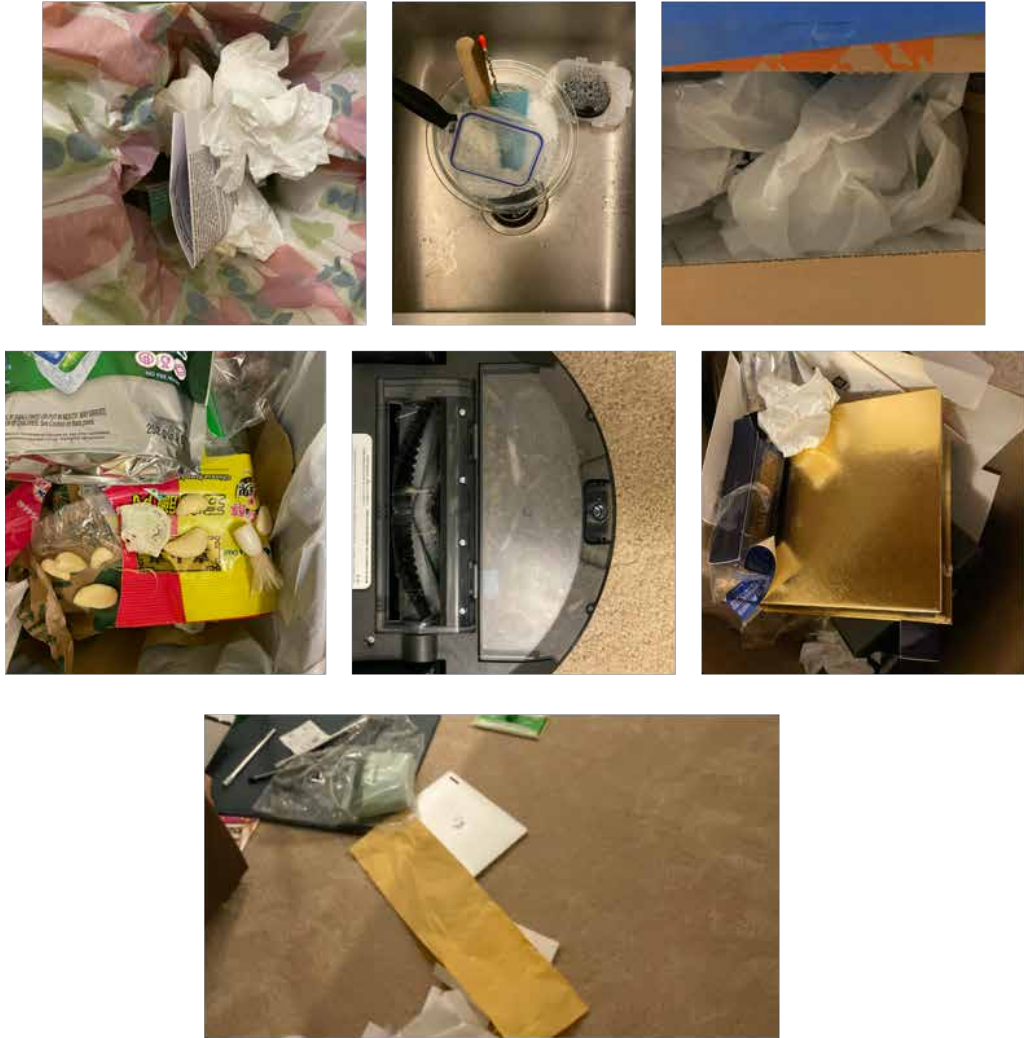
What are the moments in the house look like?

I opened albums on my phone, picked these photos. When I took these photos, I carefully adjusted the composition and the light. These moments happened at my house on an ordinary day.

However, they are too decent.



Moments in the house  
photo by me and my friend



**Real daily life in the house**

How is the real daily life in the house look like?

It is unwashed dishes in the sink, messy clothes on the chair and dust on the floor, mud under the shoes.

## *Couple rings* on dining table.

Marriage and relationships are not only about romantic, it can be annoying everyday things, it is conflicted, and it is also the art of collaboration.

In this project, I re-thought the couple rings, what messages can couples rings deliver beyond romantic promise? Salt and pepper are the essential spices in our kitchen. It is domestic. Imagine you use your rings to add spice in your meals while you are dining with your loved one. Isn't it an intrigued experience?





# Collaboration

My initial concept is designing approaches to reminds people of the inequality in current marriage life and the importance of collaboration through a collection of objects related to marriage and daily life.

In my previous user research, I found many young men would like to take the responsibility to share the domestic chores. Some of them are willing to do at least half work. Both the female and male participants also mentioned, “it is not hard to decide how to divide housework, but how to maintain the division in following days become the problem.”

To learn the possibility of collaborative housework, and how to provide an opportunity to better communicate on this through objects, I did these experiments.

## *A two legs chair* that require two people sit down to work.

Inspired by seesaw, I made this unique chair. It has two seats but only has two legs to as supporting. To make it works, two people have to put their weight on it carefully.

It provides a fun interaction, allows people to practice how to do things collaboratively. But it does not provide a dialogue about domestic chores.

### User Review

It is much more stable than I think.

It looks like a seesaw. But when we are playing seesaw, we are competing with each other. This chair needs collaboration.



## *Double handles sponge* allow two people to wash dishes together.

This new sponge works more like a toy rather than a tool. Users have to keep close with each other to make it work.

But it is not strong enough to present the inequality about domestic labor.

### User Review

It is funny to use, gamify the experience of dishwashing, maybe it is an excellent education tool for kids.



## *New broom rack*

### get the cleaning tool for your partner

I want to make an interlocked broom rack, so it would be much easier to get broom with your partner's help.

The original concept for this is to have pressure sensors on each side. So, the cleaning tools will only be unlocked when two people stepped on.



Version 1



Version 2





*A smart home system*  
force both two person do housework



1. Molly want to cook.



2. The stove doesn't work unless Fraser wash those dirty dishes in sink.



3. Fraser finished dish washing.



4. Now, Molly can continue cooking.

# Is *collaboration* the key?

I would say the collaboration is the keyword of my project. In my very draft collaborative domestic system - one person starts to cook, but (s)he can not turn on the stove unless the other one washes the dishes.

Instead of one task versus the other, considering the time that different task requirements, maybe it is one task versus two or three tasks, or multiple people multiple chores. Let people join the collaborative system is the first level of my project.

The second level is the quality of housework. It is not easy to do everything correctly in a busy schedule. If one person is doing 100% housework, it only could be 50% good. If both two-person do 50% housework, it has a higher possibility of having these things done 100% correctly.

For domestic tasks such as cleaning, also think about the size of space. It is about the method to measure the quality of household chores.



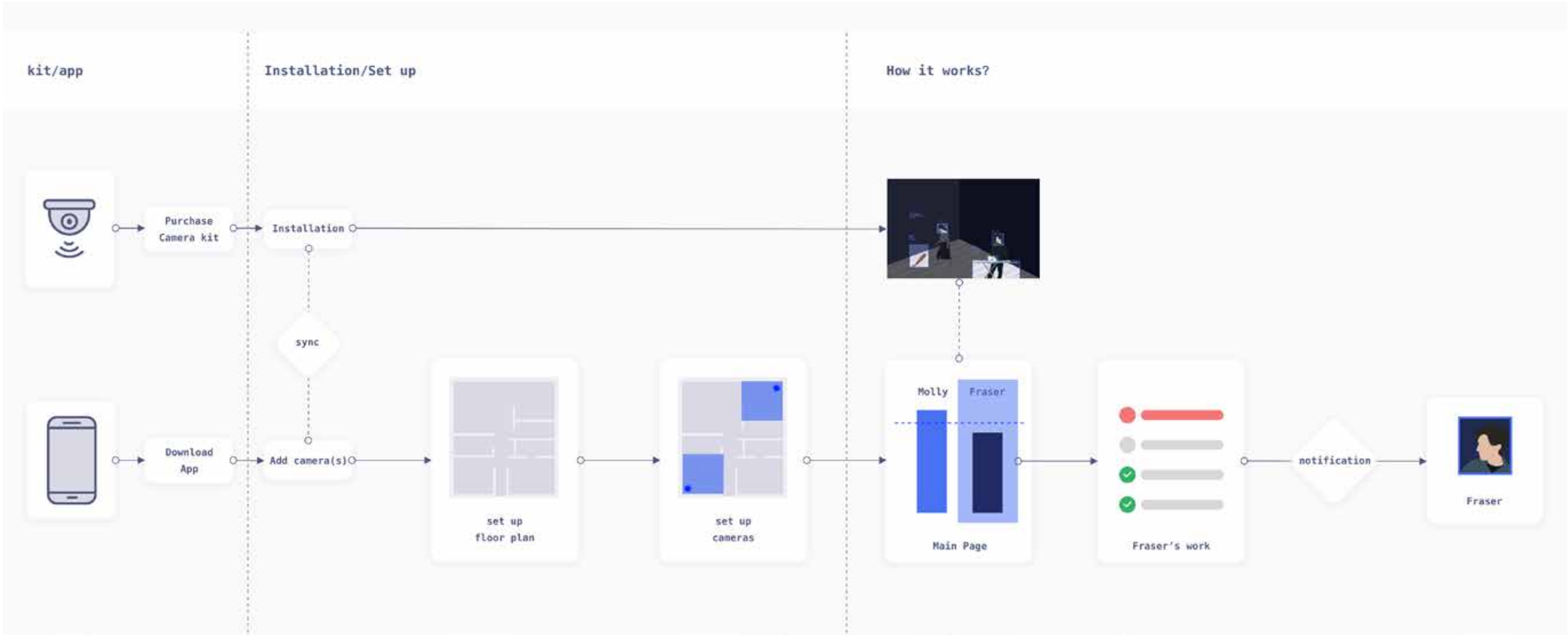
*Fifty*

*Fifty*

# Concept

After previous research and experiments, I was inspired by the smart home system a lot. Instead of forcing people to do housework together, I wish there is a method to let couples understand the time that each of them devoted to domestic chores.

So, I designed Fifty Fifty, a smart home system based on machine learning technology. It is a radical solution to inequality in the domestic realm and redefines the domesticity in modern families.

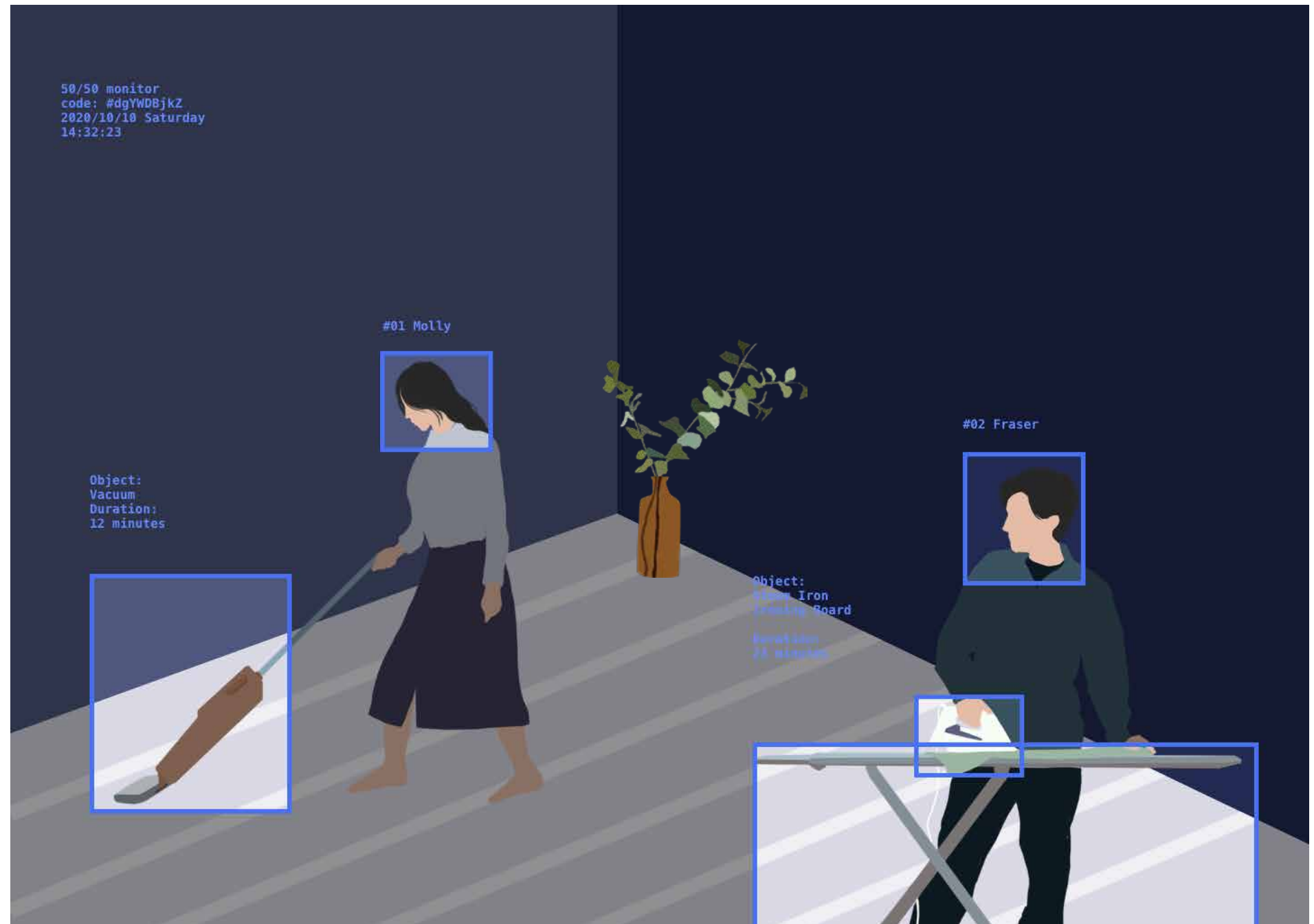


# Technology support

## The basic working mechanism of Fifty-Fifty:

Once the surveillance camera starts recording, the background program will work synchronously to analyze the video. It will identify who is here and what that person is doing.

Machine learning technology is the key to making this happen.



To test the feasibility of this project,  
I did some testings in *Runway ML*.

**Runway ML** is a machine learning tool for creators. By using existing machine learning models in RunwayML's, I did some testing as following.

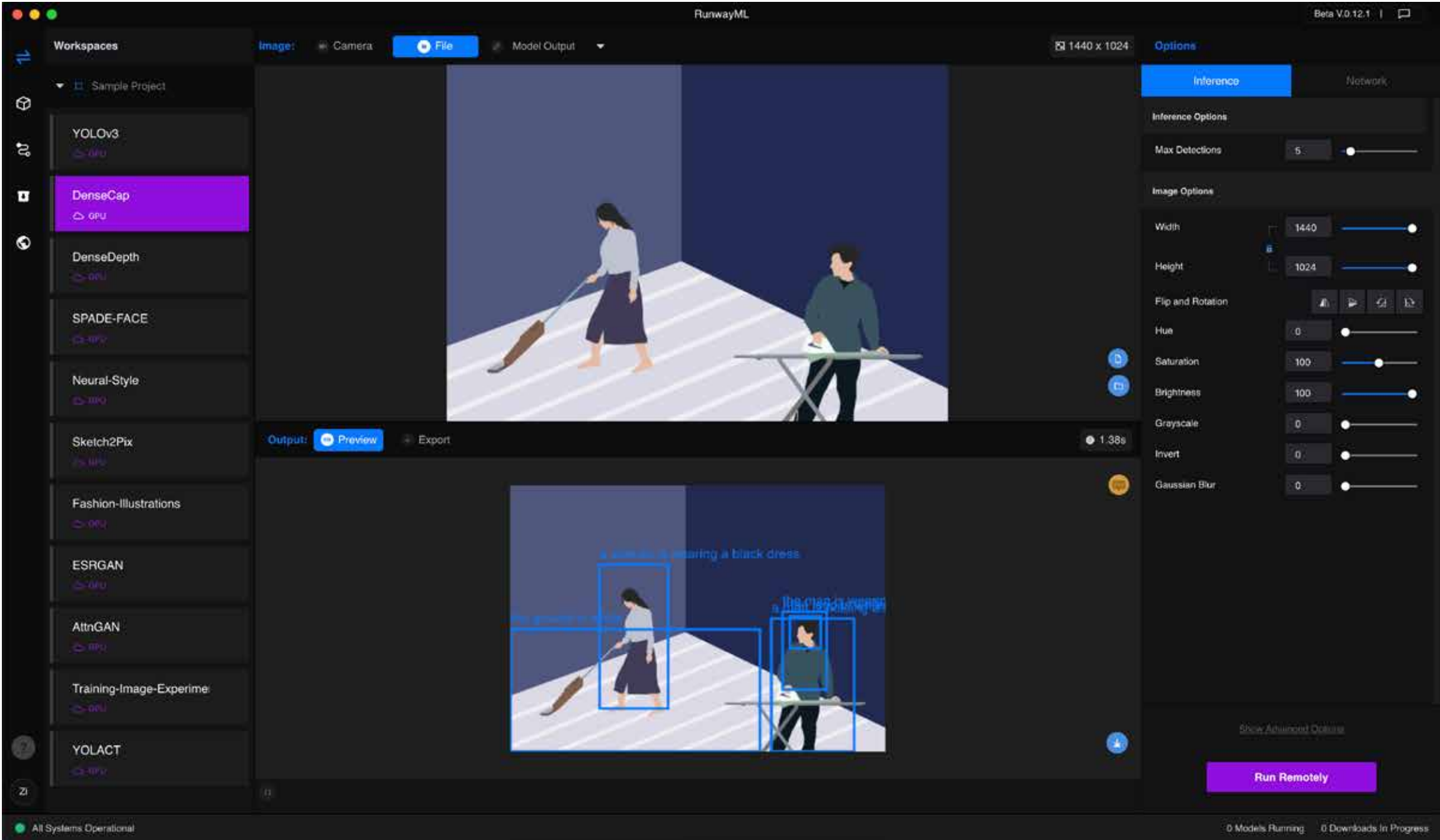




Photo by Filip Mroz on Unsplash

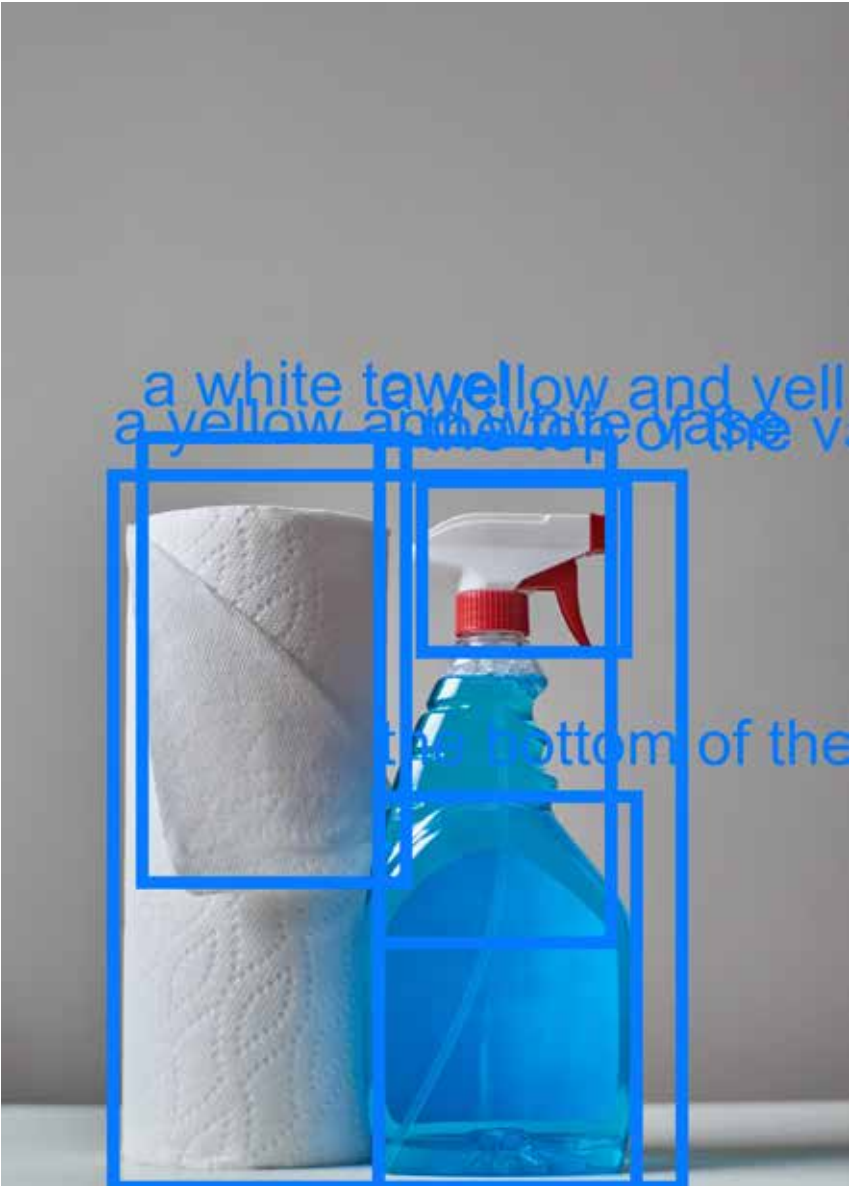


Photo by Crystal de Passillé-Chabot on Unsplash

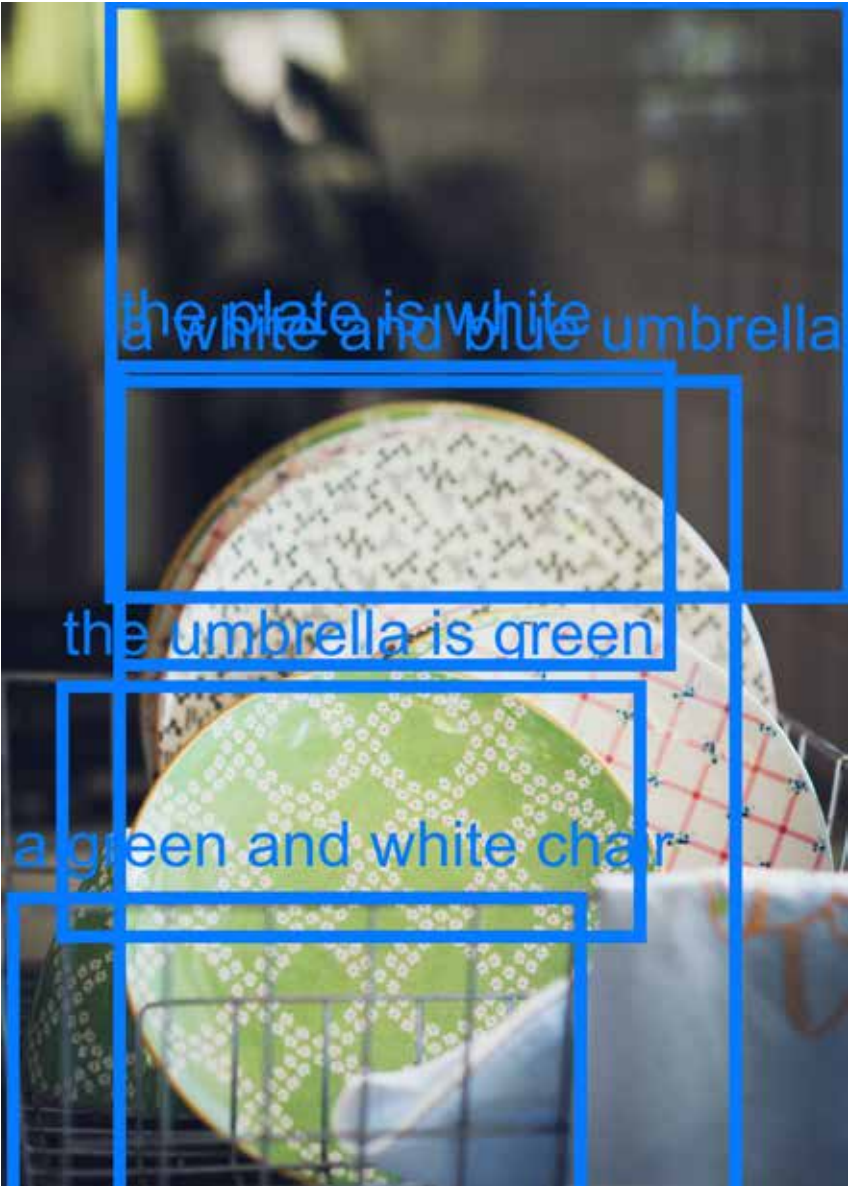
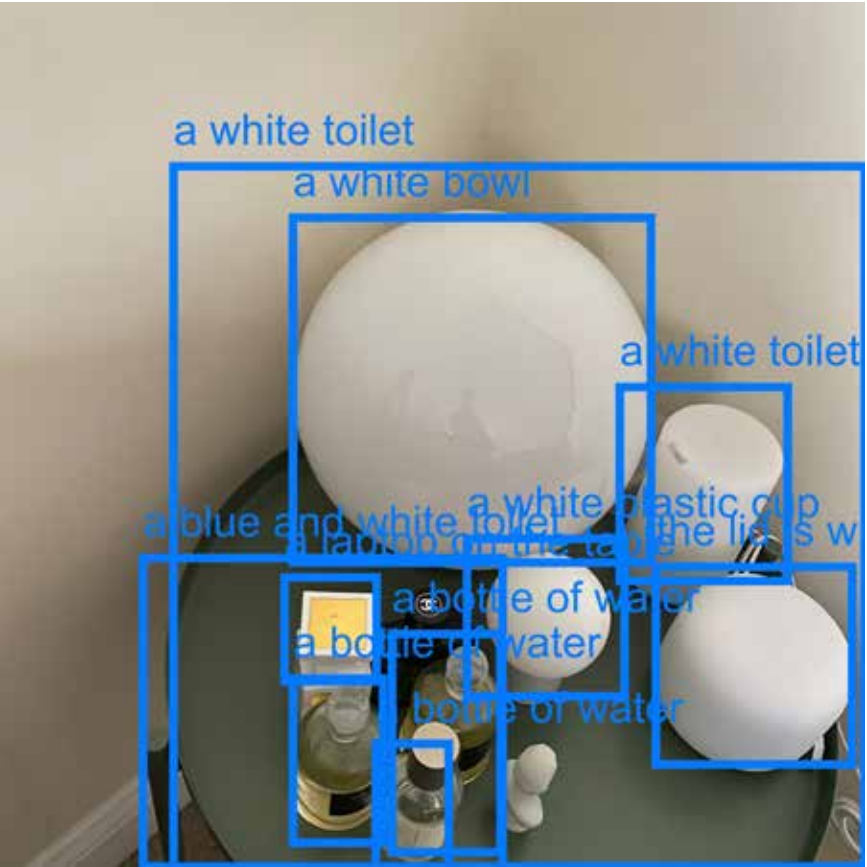
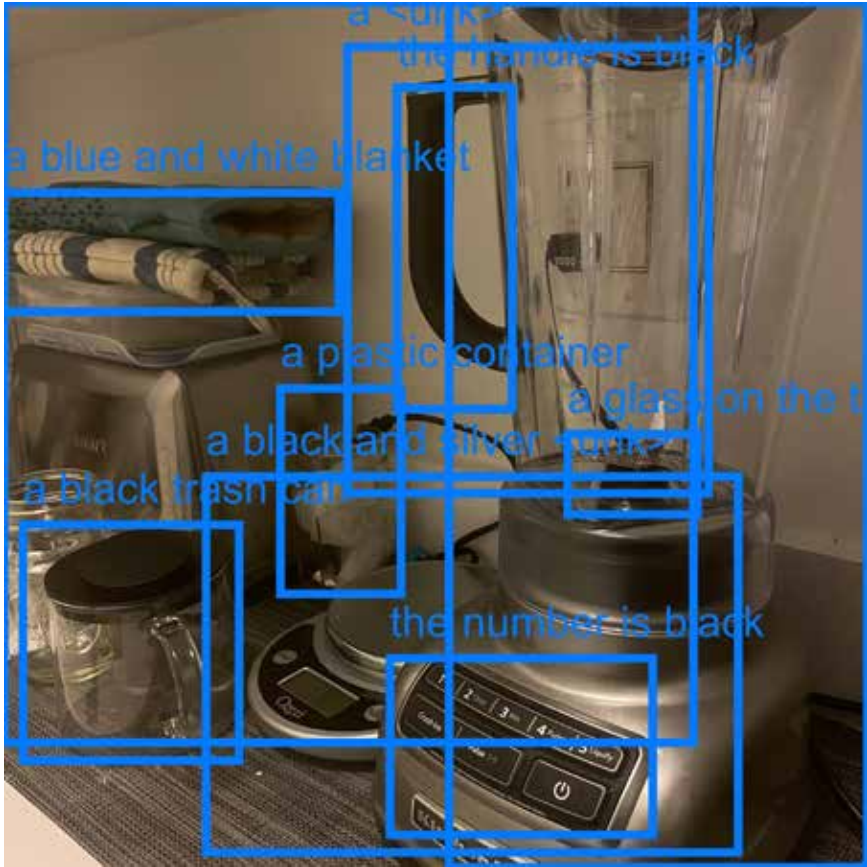


Photo by Tracey Hocking on Unsplash

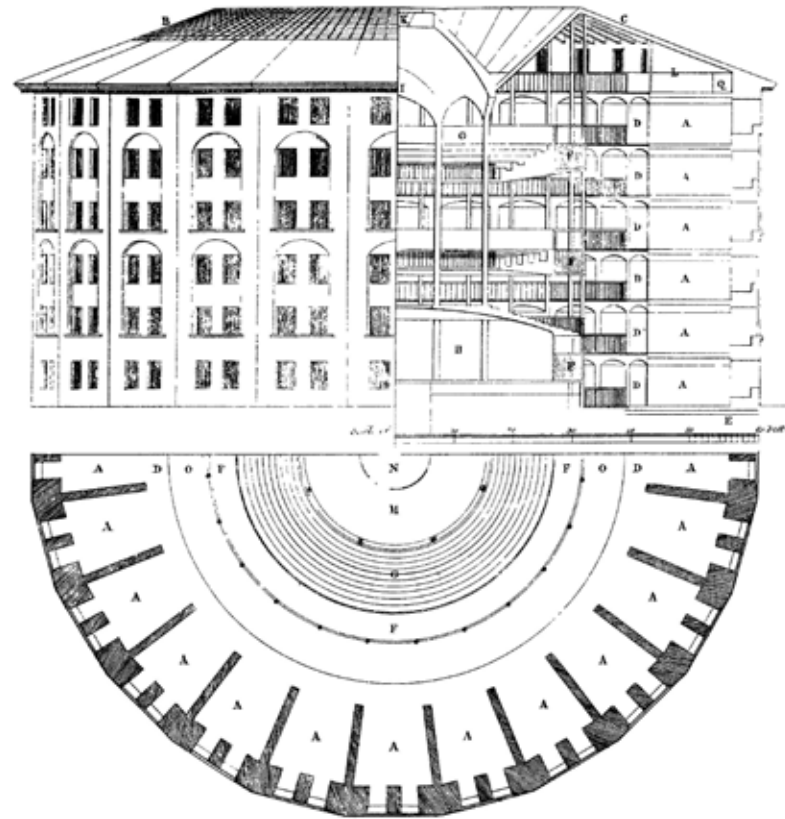




# Privacy - Transparency and Convenience

To discuss privacy, I want to refer to Foucault's idea about Panopticon here.

Foucault's view of the disciplinary gaze uses Bentham's panopticon prison as a symbolic illustration of the gaze, and everyone is under the gaze. Power works like a network, in which individuals not only flow, but they are always in a submissive position and exercise power at the same time.



Plan of Jeremy Bentham's panopticon prison  
Drawn by Willey Reveley in 1791.

What the apparatuses and institutions operate is, in a sense, *a micro-physics of power*, whose field of validity is situated in a sense between these great functionings and the bodies themselves with their materiality and their force.<sup>5</sup>

<https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/earningsandworkinghours/articles/womenshouldtheresponsibilityofunpaidwork/2016-11-10>

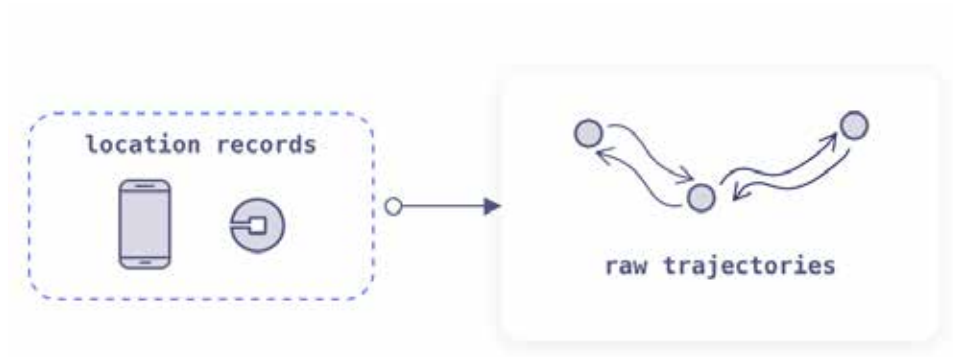
The metaphor “panoramic prison” is used to analyze the social significance of closed-circuit television (CCTV) cameras in public spaces. As an electronic panopticon, the surveillance camera became the central tower. We are under surveillance every day. It happened when we walk by the street, spent time in a shopping mall. Admittedly, surveillance video plays a significant role in protecting the property and personal safety of citizens. What needs to be guarded, however, is when and where this technology is being used.





The surveillance also happened more invisibly. With the increasingly sophisticated computer systems, especially the usage of big data, people’s movements through physical space are recorded by terminals and applications with accessible locations, forming a personal digital trajectory.

GPS on mobile phones, route tracking by taxi software, map navigation routes, this data can quickly build a person’s activity track.



# *What else* can happen beyond these trajectories?

Under the unethical situation, they can even use voice recognition to know what the customer is discussing with others. This is the convenience value of the app, where it knows customers’ needs and becomes the most understandable app. However, not all customers want their information and preference to be recorded. When the app access any information without notifying the users, it starts to affect transparency. In this app, being transparent means the app notifies the user all the steps in the system, including what information is recorded and how the system calculates what products to show to the users.

# What happens when surveillance cameras *gets smarter*?

## The AI monitor in the campus

By using facial emotion and image recognition technology, Magic Mirror system is used to detect the learning status of students in the classroom. The camera acts as an electronic teacher, observing the students at all times, and monitoring the class as a whole. The overuse of cameras and AI violated student's privacy. Every student may make a mistake. But it does not mean the school can unify the students.



# When AI cameras are introduced *into the home...*

Nowadays, many families purchase security cameras to keep their persons and property safe. In this context, the camera is primarily used to monitor if an intruder breaks into your home.

But in Fifty Fifty, I proposed that the camera be used to observe family members inside the house. When surveillance enters the private area and is used for housework observation, there are two levels of privacy. One is how the platform protects the privacy of the users from being violated; the other is how couples construct boundaries for sharing their private lives.

# Final Design





FIFTY FIFTY

Redefine Domesticity

[Overview](#)

[How it works](#)

[Privacy](#)



# Smart system based on facial recognition and machine learning.

50/50 monitor  
code: #dgYWDBjkZ  
2020/10/10 Saturday  
14:32:23

#01 Molly



Object:  
Vacuum  
Duration:  
12 minutes



#02 Fraser



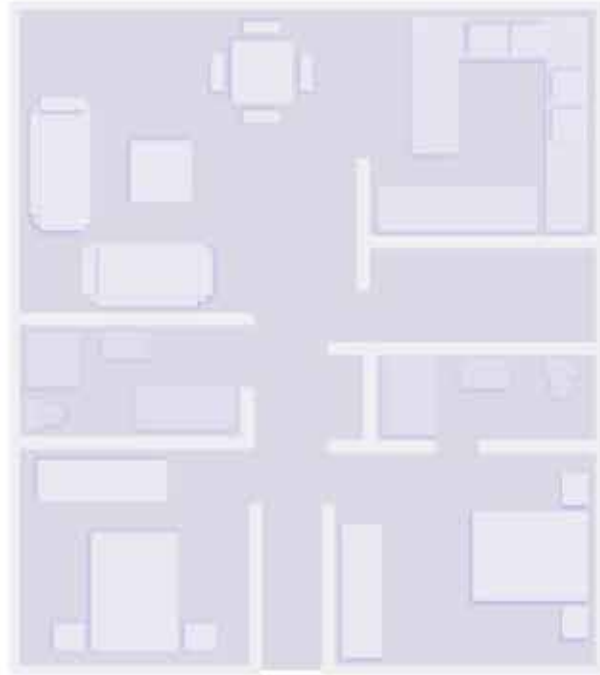
Object:  
Steam Iron  
Ironing Board  
Duration:  
23 minutes

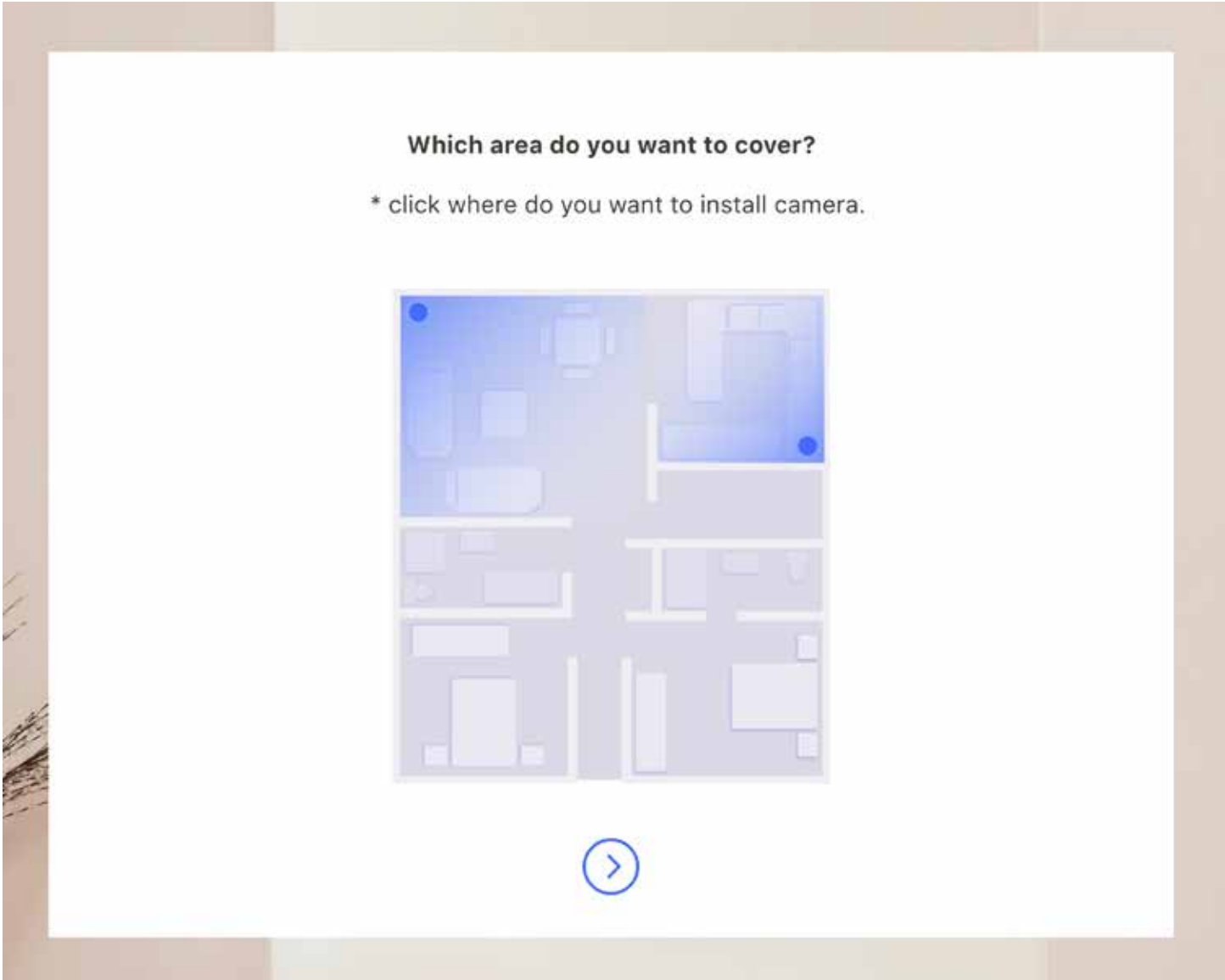




**Which area do you want to cover?**

\* click where do you want to install camera.



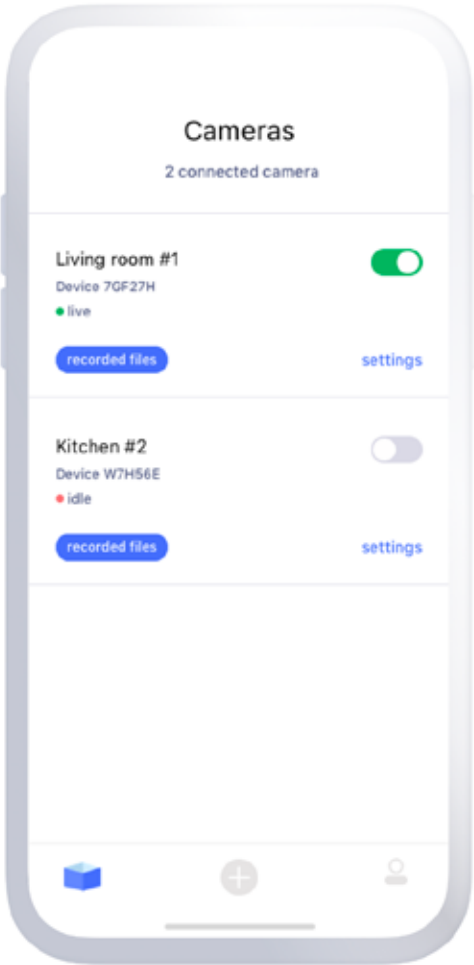


After upload the floor plan, customers can easily click on it to set cameras and know how much area will that camera cover. It is an easy way to help them understand how many cameras they need.



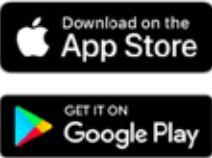
# Connected with your phone

Set up and manage your cameras with the Fifty Fifty app.



- Control your device**  
Manage your cameras just on your smartphone.
- Set your duty**  
Divide domestic chores in a simple way
- Manage recorded files**  
Manage recorded files.

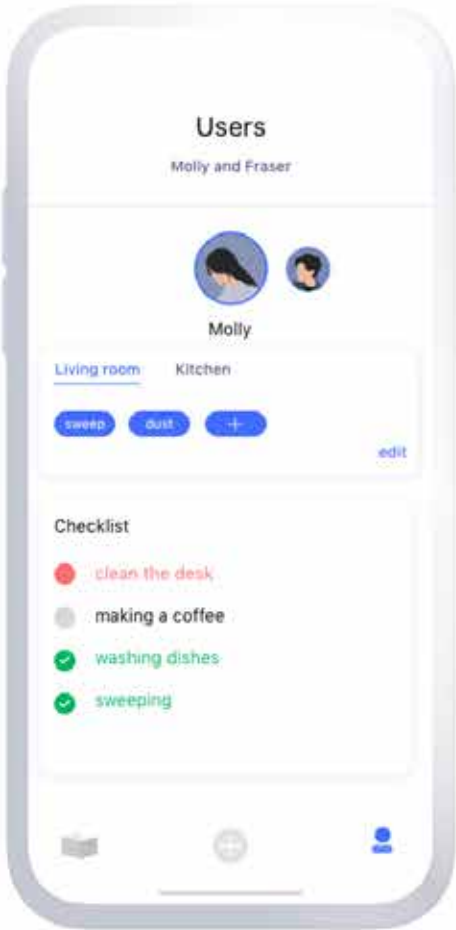
In the main page, user can easily turn on or turn off the cameras to control whether the camera catch their face.





# Connected with your phone

Set up and manage your cameras with the Fifty Fifty app.



## Control your device

Manage your cameras just on your smartphone.

## Set your duty

Divide domestic chores in a simple way

## Live score

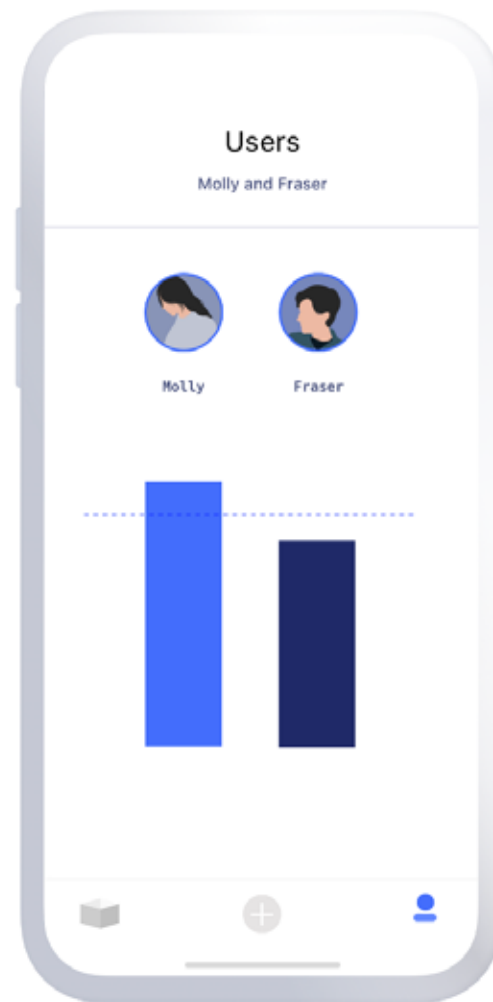
A live score page shows how much you did.



In the user page, user can see himself or herself and partner's profile. This page contains the chores that each person should do and can be modified.

# Connected with your phone

Set up and manage your cameras with the Fifty Fifty app.



- **Control your device**  
Manage your cameras just on your smartphone.
- **Set your duty**  
Divide domestic chores in a simple way
- **Live score**  
A live score page shows how much you did.

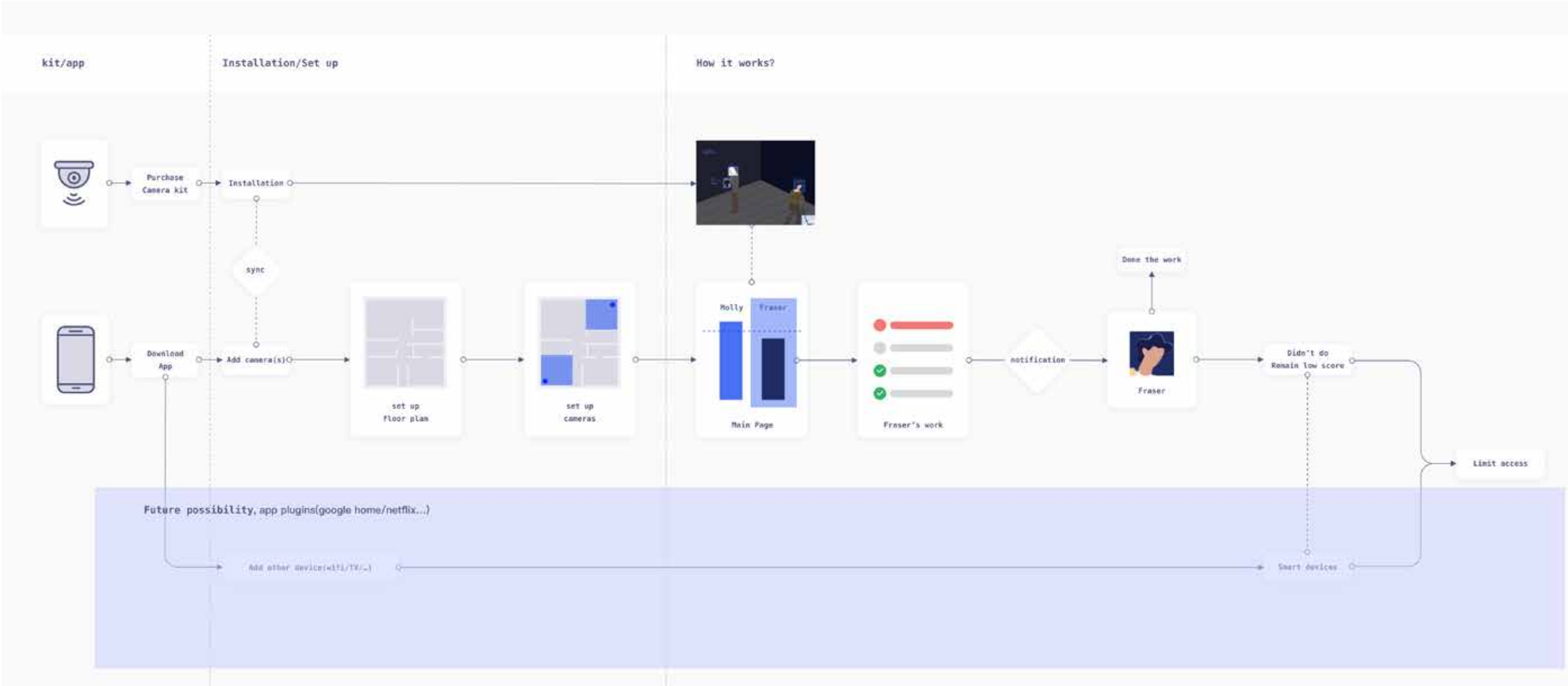
Also, here is a live score shows how much chores be done by each person. If the score remains low, the user will get a nitification.



# Future possibility

In the current design, 50/50 just presents how much housework is done by two people. It's more like providing evidence that, "You haven't been doing much housework lately. "It provides an opportunity for dialogue, but after that, how should the couple have a discussion about it?

In future applications, Fifty Fifty may incorporate rewards and punishments to limit entertainment time for those with lower household scores by connecting with other smart home products. For example, if you keep your score very low, you no longer have access to wifi or watch the show on Netflix.



# Conclusion

Human behavior is constructed by society. A person’s behavior is caused by a combination of personal factors and environmental factors.

For my thesis, I started researching with self-expression and discipline, explored how are we affected by all the discipline received from our family and society? Also, think about what image we chose to show others? Since this topic is too broad, I focused on gender roles. There is a phrase to describe a traditional female figure in Chinese — good mother, good wife. A perfect woman should take care of her family and devote her energy to her husband and children.

In the research and experiments that follow, I discuss the impact of gender roles, specifically the house, on gender inequality. In the experimental part, I explored the possibilities of collaborative housework. I designed different objects related to everyday life to remind people of the importance of collaboration. My initial idea was to develop a collection of objects related to household chores. These objects require two people to work together to complete a household task.

After the pandemic, considering the inability to use the store, I started looking for other solutions. After previous research and experimentation, I have learned a lot from the smart home system. I would like to have a way for both couples to understand the time each devotes to housework, rather than forcing everyone to do housework together.

Therefore, I designed Fifty Fifty, integrated machine learning into home security cameras. Through facial and image recognition, the system will calculate how much time each person spends on domestic chores. It provides evidence that there is someone who does more duties, and the other did less. It could be the start of the conversation.

The camera is monitoring the person in the house. But how efficient it could be? People can easily fool the machine. They can pretend they are sweeping the floor for one hour or much longer. But there is no way to judge how is the quality of the chores could be done. To make it works, for example, it might be necessary to record how long it takes to clean the living room by each person. After several times, it could come up with an average time and use it in the following data analysis. Besides being used in a home environment, 50/50 has the potential to be used outdoors, such as in a garden.

Will gender equality increase when housework is done under surveillance?

How will people respond to it?

# Bibliography

De Beauvoir, Simone. The second sex. Knopf, 2010.

Marina Abramović and ULAY. Rest Energy. 1980 | MoMA. (n.d.). Retrieved from <https://www.moma.org/audio/playlist/243/3120>

Roberts, Marion. “Gender and housing: the impact of design.” Built Environment (1978-) (1990): 257-268.

Wong, Kristin. “There’s a Stress Gap Between Men and Women. Here’s Why It’s Important.” The New York Times, 14 Nov. 2018, [www.nytimes.com/2018/11/14/smarter-living/stress-gap-women-men.html](http://www.nytimes.com/2018/11/14/smarter-living/stress-gap-women-men.html).

Harper, Phineas. “Nuclear Family Home Tool Repression” Dezeen, 18 Apr. 2019, [www.dezeen.com/2019/04/18/nuclear-family-home-tool-repression-phineas-harper/](http://www.dezeen.com/2019/04/18/nuclear-family-home-tool-repression-phineas-harper/)

Lockman, Darcy. “What ‘Good’ Dads Get Away With” The New York Times, 4 May. 2019, [www.nytimes.com/2019/05/04/opinion/sunday/men-parenting.html?action=click&module=RelatedLinks&pgtype=Article](http://www.nytimes.com/2019/05/04/opinion/sunday/men-parenting.html?action=click&module=RelatedLinks&pgtype=Article)

Vanek, Joann. “Time spent in housework.” Scientific American 231.5 (1974): 116-121.

Maume, Zai Zai Lu, David J., and Marcia L. Bellas. “Chinese husbands’ participation in household labor.” Journal of Comparative Family Studies 31.2 (2000): 191-215.

Prochaska, James O., et al. “Stages of change and decisional balance for 12 problem behaviors.” Health psychology 13.1 (1994): 39.

Collins, Gail. When everything changed: The amazing journey of American women from 1960 to the present. Little, Brown, 2009.

Yu, Yan. “Reconstruction of gender role in marriage: Processes among Chinese immigrant wives.” Journal of Comparative Family Studies 42.5 (2011): 651-668.

Foucault, Michel. Discipline and punish: The birth of the prison. Vintage, 2012.

Zhang, Cui-Xia, and John E. Farley. “Gender and the distribution of household work: A comparison of self-reports by female college faculty in the United States and China.” Journal of Comparative Family Studies (1995): 195-205

Staudenmaier, John M. “In the Age of the Smart Machine: The Future of Work and Power.” (1990): 192-194.

Zhang, Fan, et al. “Uncovering inconspicuous places using social media check-ins and street view images.” Computers, Environment and Urban Systems 81 (2020): 101478.

Eggers, Dave. The circle. Art People, 2015.

