

Exploring Intuitive Ways To Recognize Escalators' Directions

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Part 4

Prototype and Final Report

Abstract

Escalators are common tools in shopping malls, while people use them quite frequently, they would always encounter problems in recognising the escalators' directions due to various reasons. Solving this problem can improve customers' overall experience while shopping, and result in an increase in the traffic of the shopping malls and may help to increase their profits.

In order to address the needs, I conducted two rounds of observations, based on what I found, I created two personas and a set of storyboards, I further concluded some requirements and then developed a prototype. With the rough prototype, I test two users and see their reactions to the design.

The idea of the final design is to provide various cues for users to judge the escalators' directions, and guide them to the correct one subconsciously. With this purpose, I made the prototype with cardboards, construction paper, pins and many other tools, and used colors (green and red) as cues. The prototype is based on one of the floor plan of Water Tower Place, with a focus on the escalators. In the evaluation, I tested two customers, first, I used uncolored prototype and asked them to find the escalator to the upper floor. After that, I changed the escalators' positions and colored the escalators, and asked them to find the one going up again. One of my subjects didn't perform as I expected, but the other one found the correct escalator in the second test quite easily.

With only two subjects, the sample size is too small. In future, I would test more people with the prototype and see if using colors is a good idea to indicate the directions and ask users for more advice. Meanwhile, looking for more useful cues and exploring how to make them helpful to users is another major topic.

Correspondence and Interaction

In previous assignment, I thought the correspondence was "the attraction between the shopper and his destination floor, the escalators serve as passive transducers". However, after finally defining the problem, the correspondence appears to be inappropriate. Such correspondence happens only when "users go from this floor to another floor using escalators", but it does not address the process when users look for escalators.

Considering the problem identified above, I redefined the correspondence as "the customers go to the correct escalator which goes for their desired direction", the transducers are "the cues which guide the customers to go to their escalators". Any of the three main reasons (dimension conversion, social property, misposition) would make the cues fade, which result in the situation that it's difficult to find the correct escalator, this is when inter-actions happen.

The reasons why people make mistakes

As addressed in previous work, there are three main reasons why people make mistakes in judging the directions of the escalators:

1. Dimension conversion results in loss of key information for judging the directions.
2. Strong social property in shopping malls that prevents people from searching for cues to

judge the directions.

3. Escalators are not positioned properly for customers to get their directions. (this is my another assumption after observation in A3, but I haven't clearly explained it yet)

Solutions

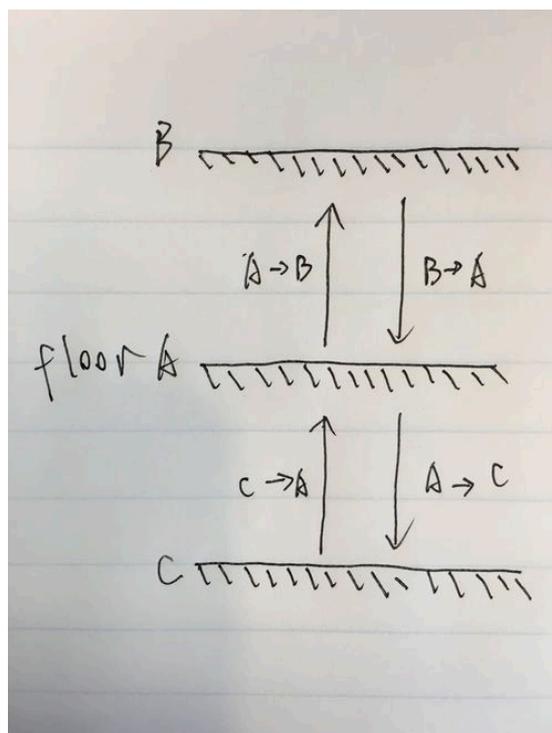
In the current state, the only transducer (cue) is the movement of the escalators, before customers can go for their escalators, they need to stop, look at the escalator, try to find out the escalators' movement directions. However, because of the three reasons discussed above, it's difficult for customers to find this transducer.

The main idea of the solution to this problem is to provide as much cues as possible for users to find out the directions. Instead of only depending on the movement of the escalators, customers could use many other things as cues, such as colors, arrows, lights, etc. The cue should be efficient enough so that customers can notice it without looking for it proactively, customers should also be able to see the cue from anywhere on the floor. The ideal result of this solution is to transfer the whole floor (or environment) to a transducer which helps users correspond with the escalators.

Final Design

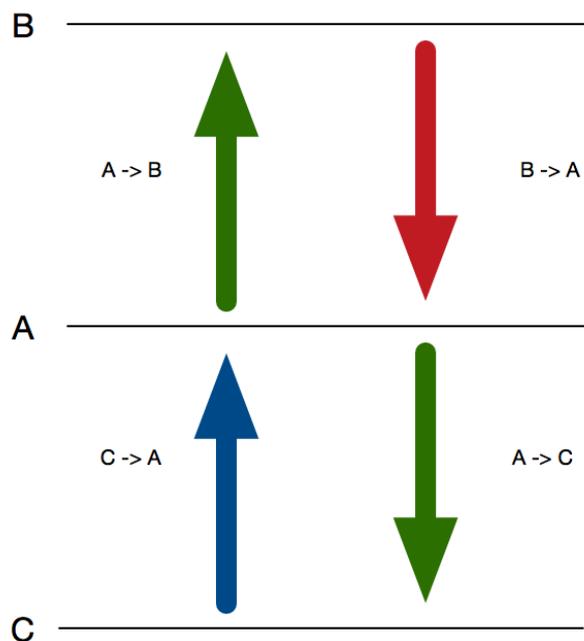
Design Logistics

The picture below is from the first assignment of this project which demonstrates how escalators are organized in shopping malls, each floor is connected with four escalators: from lower floor to this floor, this floor to upper floor, upper floor to this floor, this floor to lower floor.



This picture shows clearly that for each floor (except the first floor and the last floor), there will be at least four escalators going different directions.

While the purpose of this project is to look for ways to recognize the directions, we should first address which directions are needed by users. Consider this, when users are on this floor, which escalators are actually useful to them? It should be the escalators from this floor going up and going down, as for the other two escalators, customers can't use them. From the picture above, if users are now at floor A, he can only use two escalators: A - B (this floor to upper floor), and A - C (this floor to lower floor). This is demonstrated by the picture below:



when customers are at the floor A, only the two green arrows can be used by them, thus, these two escalators should be clearly distinguished

In a word, the escalators going from this floor are the only two that can be used by users. Thus, combining the three main reasons, the problem of recognizing the correct direction can be further explained as: **Are there any ways to eliminate or minimize the impact of dimension conversion, social property and misposition of escalators so that users can easily identify the two escalators which are going from his floor to other floors.**

Constraints and problems

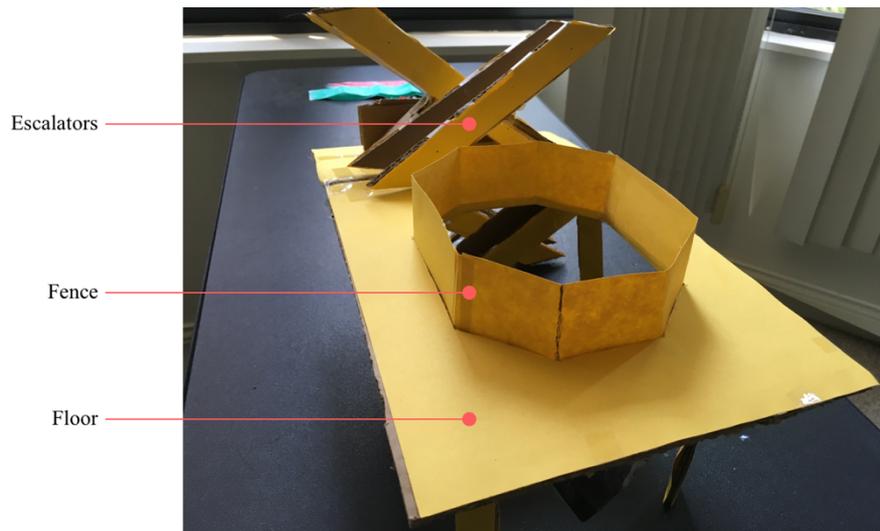
Except for the three identified problems, this solution still has to deal with other issues:

- Figure out what other cues could be used.
- How to relate different cues to the escalators and make sure customers understand them.

- How to make these cues more recognizable for users.
 - Will these cues influence the interior design of the shopping malls.
- These problems will be addressed in further research.

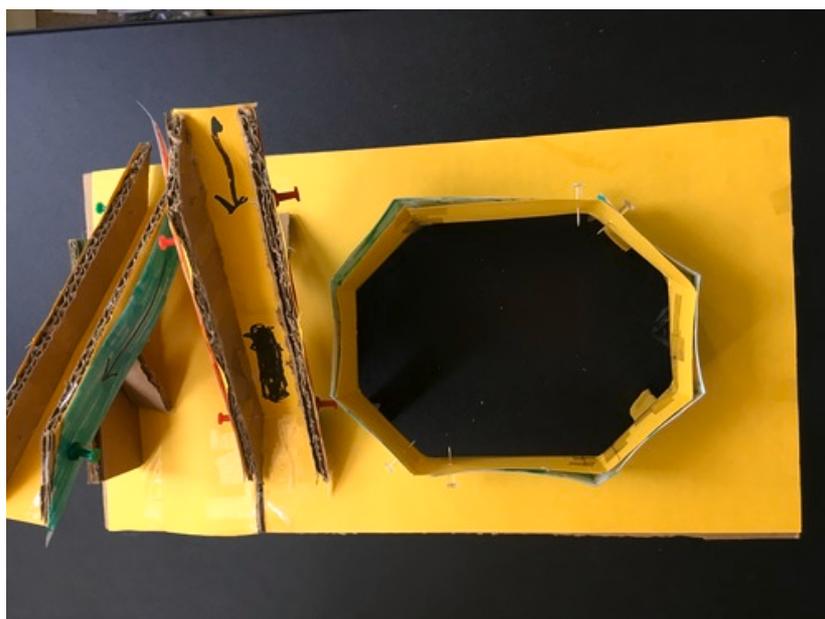
Prototype

In terms of prototype, I made a model of the floor plan for the Water Tower Place, and designed the solution based on it. The prototype is made with cardboard, construction paper, and some other tools.

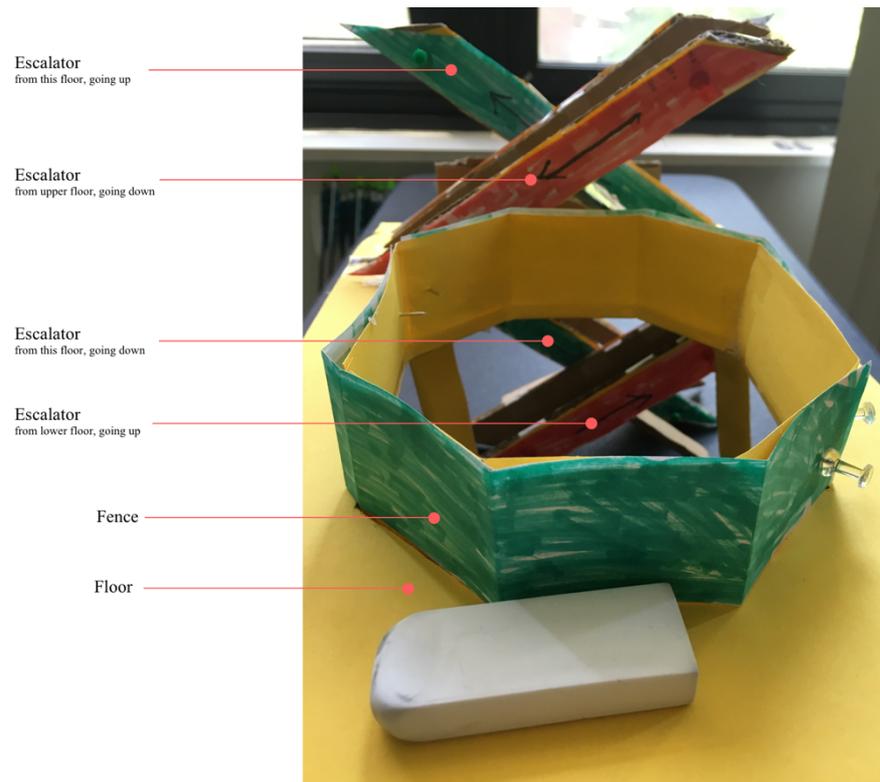


original model

The original model consists of fences, floor, and escalators. They are in same color, and the only cue is the arrow drawn inside the escalators, as shown in the picture below:



Apparently, it's almost impossible to identify the directions from anywhere of the floor.



Solution Model

So I used colors as the cues. In my model, the escalators going from this floor are colored green, and the other two escalators are colored red. But I'm still concerned whether the Movers will notice the colors, or will they understand the meaning of different colors, so I made the fences green as well, which is the same color with the escalators going from this floor, hoping that customers will notice the relation between the escalators and this floor.

From the picture of the design solution, I think it should be much easier to distinguish the directions.

The main idea here is not about colors, it's about how to relate this floor to the two escalators which are going from this floor (to upper or lower floor), and there should be sufficient cues for people to use so that the Movers don't have to look for them proactively. That said, it is really difficult and I don't really know if there are any other efficient ways to do this.

After recognizing the two green escalators, one connecting to the upper floor, another one connecting to the lower floor, users can know the correct escalator without any efforts. If they are going up, just go to the one connecting to the upper floor, if they want to go down, then go to the escalator connecting to the lower floor.

Evaluation

Task:

Imagine you are going to buy a T-shirt, after seeing almost all the shops on this floor, you still couldn't find one that you like. Thus you decide to go to the upper floor. Please use this model of the floor plan in Water Tower Place and walk me through how you find the desired escalator.

Process:

1. ask users to conduct the task using the uncolored model.



2. change the positions of the escalators and ask users to conduct the same task again using the colored model.



(note: there's no arrows when this task was conducted by subjects. I added the arrows after the test because both my subjects recommended so.)

Subjects

- Subject A is a Depaul graduate student in Game development program, he is 24 and does not often go to shopping malls. Potentially he is a Judger when in shopping malls.
- Subject B is a Depaul graduate student in Human Computer Interaction program, he is 25 and would sometimes go to shopping malls with friends. He might be a Mover in shopping malls.

Results

- When doing the first task, subject A chose the right escalator at the first try, subject B chose the wrong escalator and tried a second time to go to the right one.
- When doing the second task after the positions of the escalators are changed, subject A went to the wrong escalator while subject B recognized the right one easily.

Debriefing

- Notice here that subject A is not notified that the escalators' positions have been changed, so when he is doing the second task, he was actually using his previous experience in the first task. That's why he made a mistake. Thus when I tested the prototype with the second subject, I told him specifically that the escalators had been relocated.
Even so, this may be a signal that some customers may not be able to recognize colors as cues for judging the directions.
- Both subjects recommended to add arrows directly on the escalators. While I agreed with them, there are two reasons I didn't do this in the test: Firstly, I want to test whether the colors work or not, if there are arrows on the escalators, they may probably ignore the colors as cues. Secondly, customers, especially the Movers may probably won't notice the arrows, as explained in previous assignment, even when there are people on the escalators whose movement could absolutely indicate the directions, customers would simply ignore such an obvious cue.
But this cue may be very useful for the Judgers, so I added them after the tests.
- The first subject seems dissatisfied with the solution, he couldn't get what the colors mean at first, especially why the fences are colored green, until I explained to him, he thought arrows or something else to point out the directions should be much more efficient than colors.
The second subject could get the meaning of the colors, but he also thought this may not be a good solution because the shopping malls might not be willing to color the fences or escalators.

Conclusion and Further Work

Conclusion

In this project, I identified that people need a more intuitive way to discover the directions of escalators in shopping malls so that they could make fewer mistakes in looking for their escalators.

The ideal solution is to provide as many cues as possible for both the two kinds of users -- the Movers and the Judgers -- to easily identify the two escalators which are going from his floor to other floors, the cues should be efficient enough so that customers can notice them without looking for them proactively.

Based on the main idea of the solution, I made a model of the floor plan of Water Tower Place and used green and red colors as the cues. Subjects are asked to perform two tasks with both uncolored and colored model respectively. After the testing, users do not seem to be enthusiastic about this solution, and provided several useful opinions on how to improve the solution.

Further Work

While my subjects seemed dissatisfied with the prototype, I think this is mainly because I didn't come up with a better way to present the cues, besides, it might be better to make the prototype in a larger size or in the real environment. Using colors alone is also difficult to tell them the directions because they need to figure out what it means by each color.

In future work, I want to change cues to explore other potential solutions, and combine different cues together to make it more intuitive, for example, use lights of different colors to show the directions. Another important thing is to study how to organize and present these cues so that customers won't be confused and distracted by them, ideally these cues could also make the overall shopping environment more convenient.

Reflection

What was the greatest project challenge you needed to overcome?

The greatest challenge for me is to figure out how to make the prototype. I struggled a lot thinking about which cues to use and how to use them. I finally decided to use colors. I also spent a lot of time thinking about how large the model should be and finally decided to make a relatively smaller one for that I can make a full model with a small size, if the size is too large, I won't be able to show subjects the escalators connecting to the lower floors.

Making the model took me about two days, which is much longer than I've expected. I didn't know what tools might be used, so I only collected some before I start making the model, for other tools, I had to go to shops and look for them when I encountered certain problems. Coloring the model was also another big issue, I could draw colors on the escalators with a color marker after I tested one of my subjects, but if so, I wouldn't be able to test the prototype with another subject since it was already been colored. I wanted to make the model reusable, so I made several colored strips and used pins to pin the strips to the model. Through this way, I could use it again and again to test different conditions(both colored model and uncolored model) with different subjects.

What was the most surprising thing you discovered by doing the project?

The power of thick description surprised me most. I never thought just observing people doing actual things could help me find a lot of useful information. I knew people would have problems in recognizing the escalators directions, but only after I observed what people

actually did in the shopping mall before and after they began to look for escalators did I noticed that the cause of this situation is much complicated than I've thought before.

What was the most enjoyable part of the project? The least enjoyable?

Most enjoyable part was observing people using the escalators and sketching out their process, it was interesting to see how they actually interact with escalators. Least enjoyable was evaluating the final prototype with users because it does not work out as what I've expected.

What is the most valuable lesson or take-away that you have from the project?

From this project, I've learned that in HCI field, thinking about the problem by yourself will not yield a good solution. Only observe how people actually do things can we find the true problem and thus go to the right track in finding out the solutions.

If you did the project over again, what would you change? What would you keep the same?

I'll keep most of the part the same, the only thing I want to change is the cues in the final design. I won't use colors again, instead, I want to make a larger model and use lights to indicate the directions. For example, we can install the lights on the handrail of the escalators so that they can move along with the escalators. This might act as another cue.

However, the biggest issue of the solution is still figuring out how to organize these cues to make them intuitive and find out more potential cues.