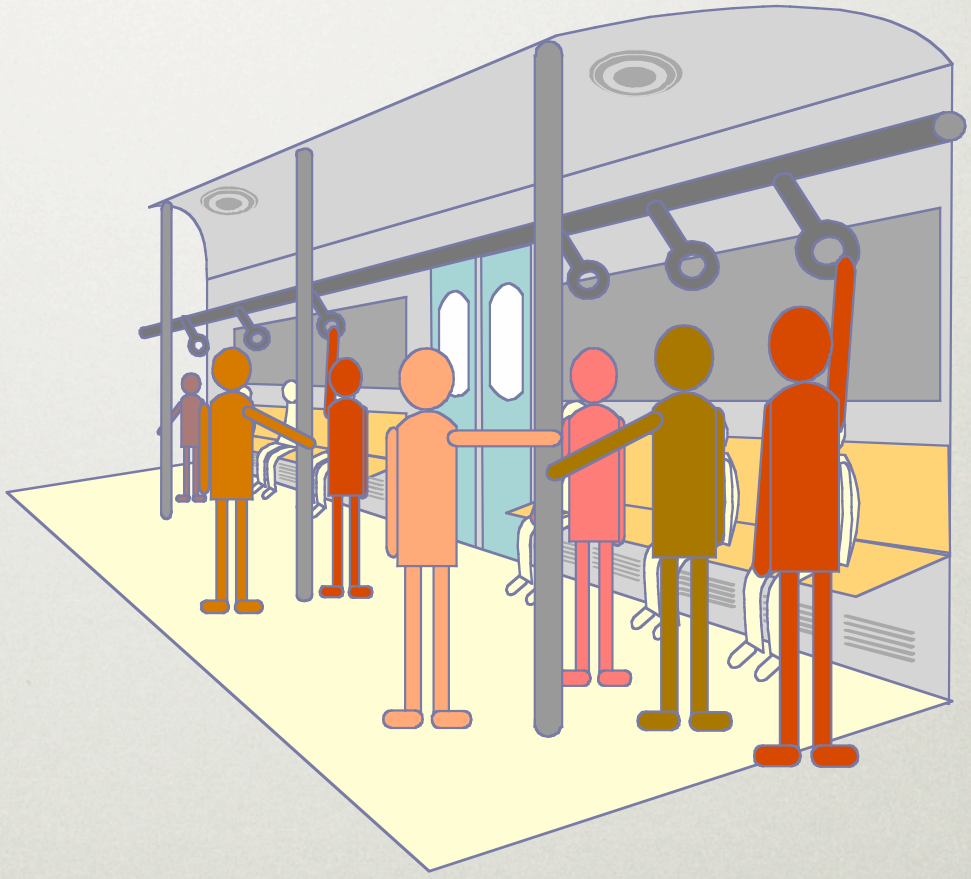
Interactive Design for Subway Car

Designed by Jing Zheng



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Overview

Subway cars are interesting spaces that can be used to carry out interactive design ideas. In this design project, I focused on promoting non-verbal interactions among passengers by envisioning the subway car as a body system.

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Research Question

- I'm studying relationship between people in the subway car as a body system
- Because I want to find out how to design an environment to let people be aware of each other in the same public space
- In order to promote the emergence of collective interconnection among people in the physically confined environment

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Inspiration

- Personal experience: during traveling in the subway train, although people share the same physical environment, but mentally, they are isolated from each other...
- Subways bring people from a wide range of social and cultural backgrounds into the same space and have the same movement together.

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Design Concept :: Public Space :: Subway Car

- Subway car as specific environment to do the research
- Passengers' collective behaviors would change the features of the system
- To promote their non-verbal interactions and their awareness of other people

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Precedent :: familiar stranger

- Intel Research lab @ Berkeley

  http://berkeley.intel-research.net/paulos/research/familiarstranger/index.htm

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Precedent :: Collective behavior in public space

- The Layer Greyworld

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Conceptual Precedent

Responsive architecture

"If architects designed a building like a body, it would have a system of bones and muscles and tendons and a brain that knows how to respond....."

Guy Nordenson

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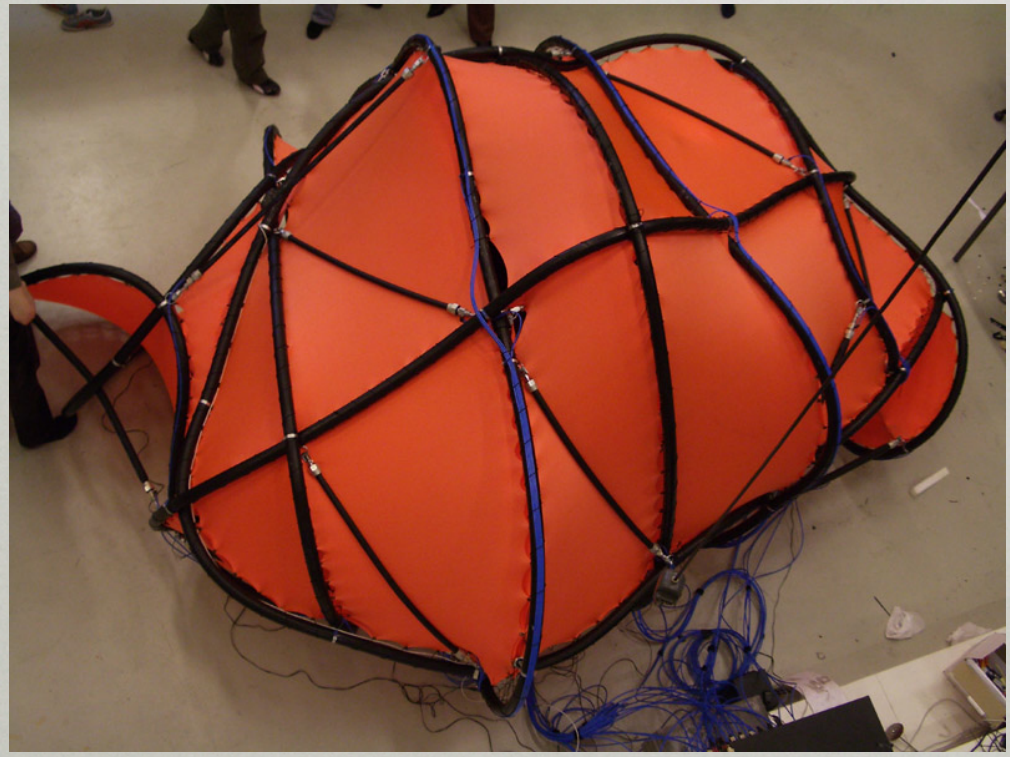
Precedence :: Responsive architecture



- Muscle Body — The Hyperbody Research Group [HRG], Delft University of Technology

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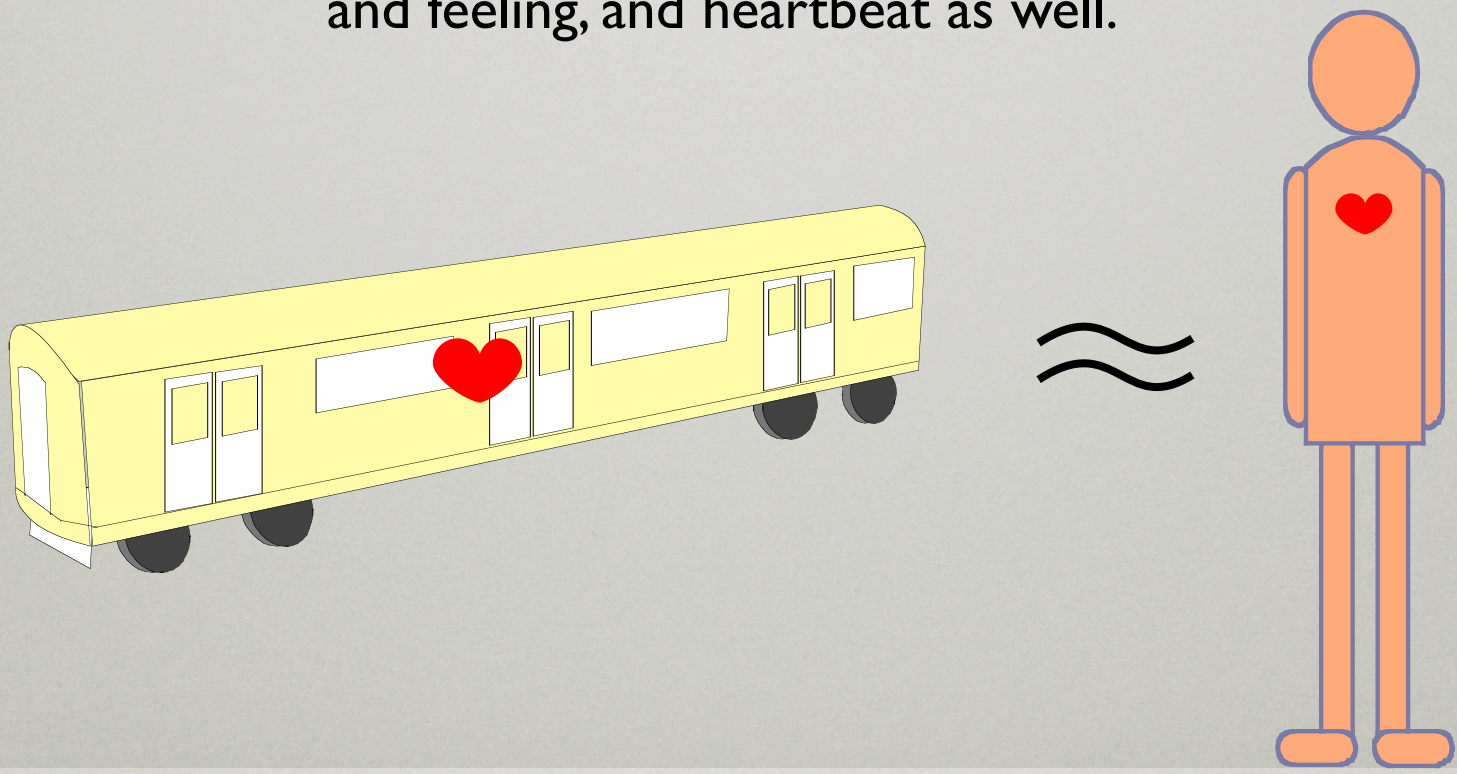
Methology

Imagine the environment of a train car is like a system of human body, it may have the senses and feeling, and heartbeat as well.



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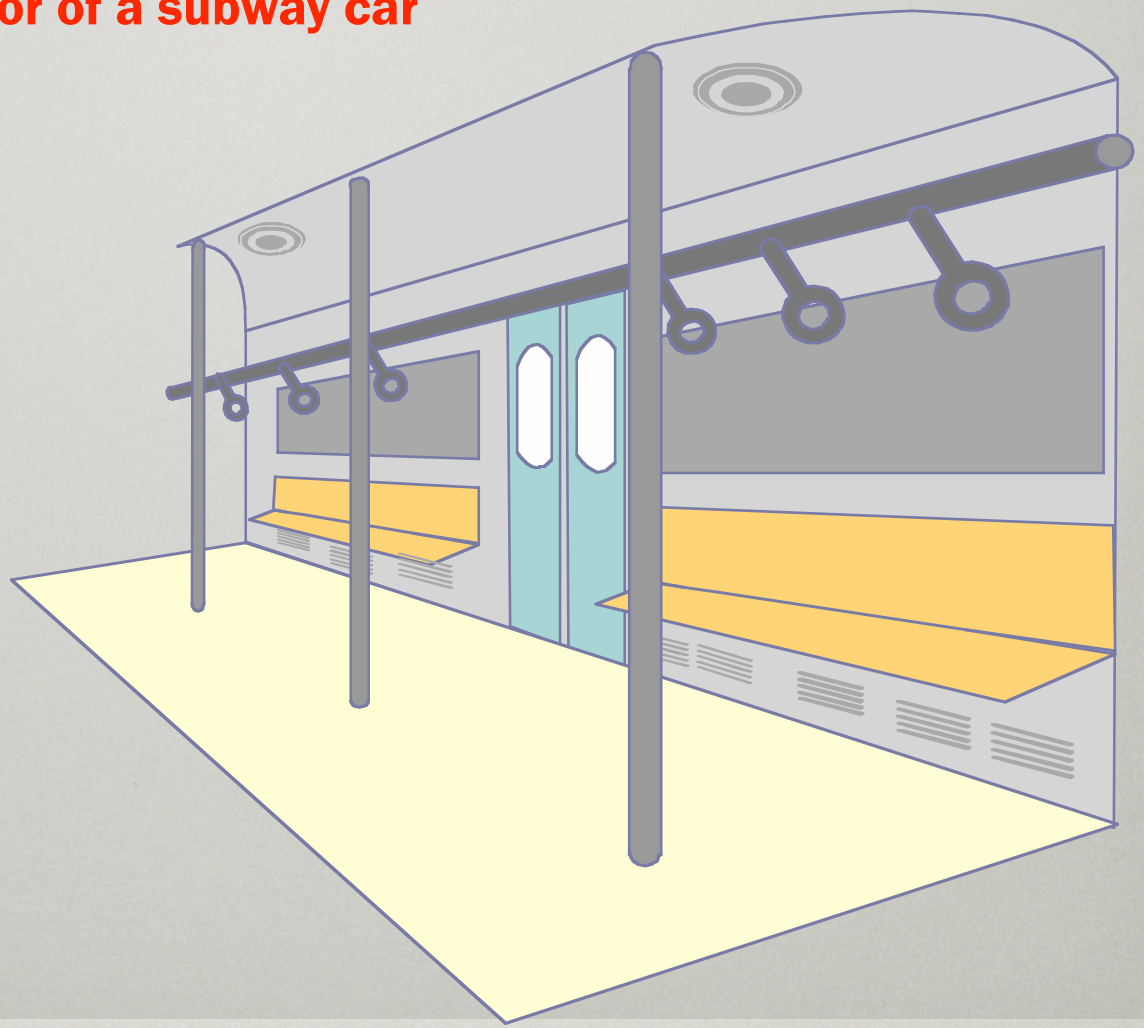
Interior of a subway car



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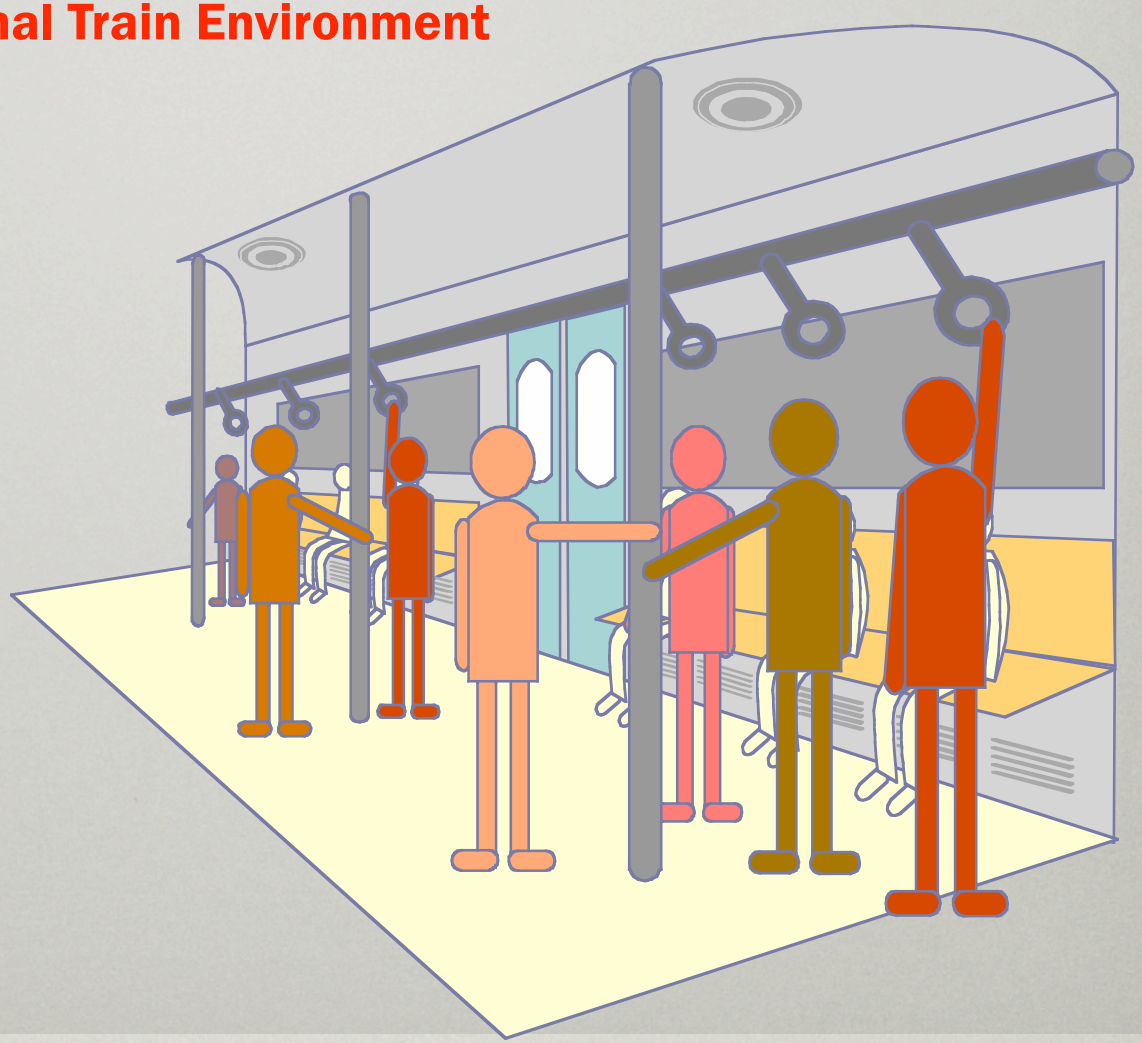
Original Train Environment



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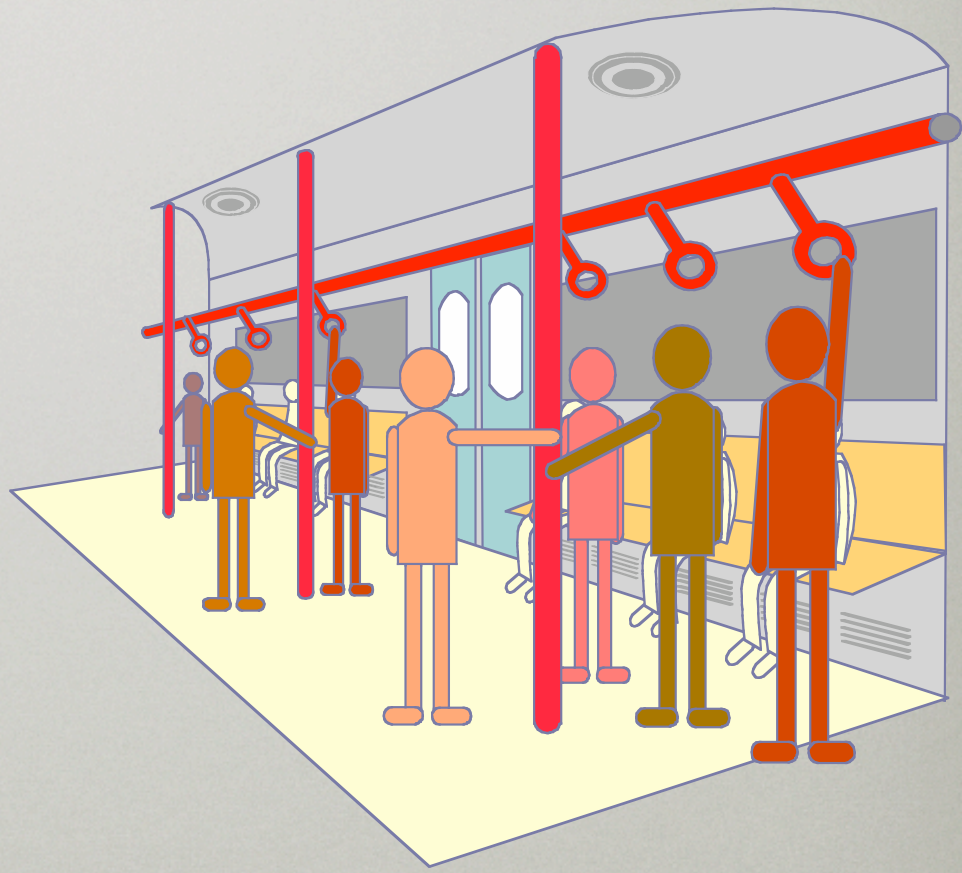
Design approaches 1



- the poles and the hand-grips are tools for people to connect

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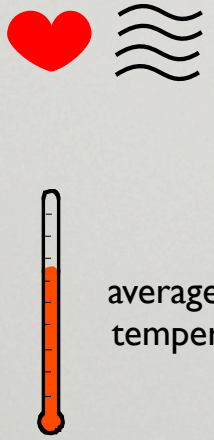
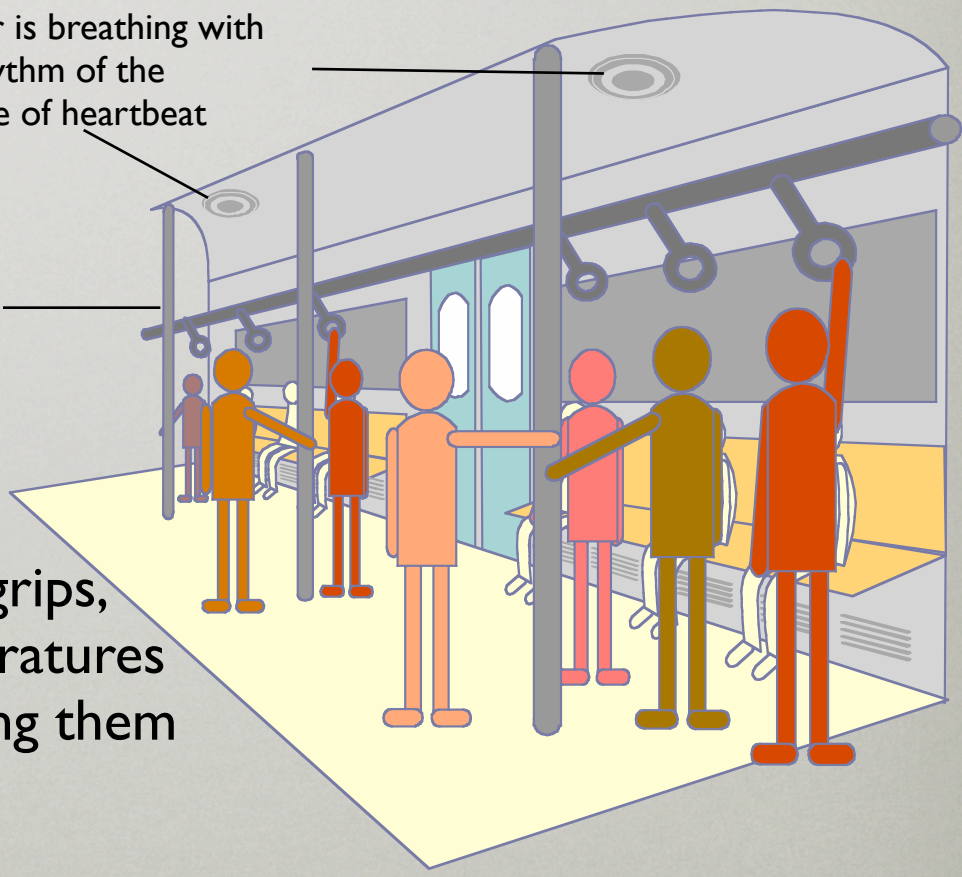
Design approaches 1



the car is breathing with the rhythm of the average of heartbeat

average body temperature



- install sensors into poles and hand-grips, which can measure the body temperatures and heart beats of the people holding them

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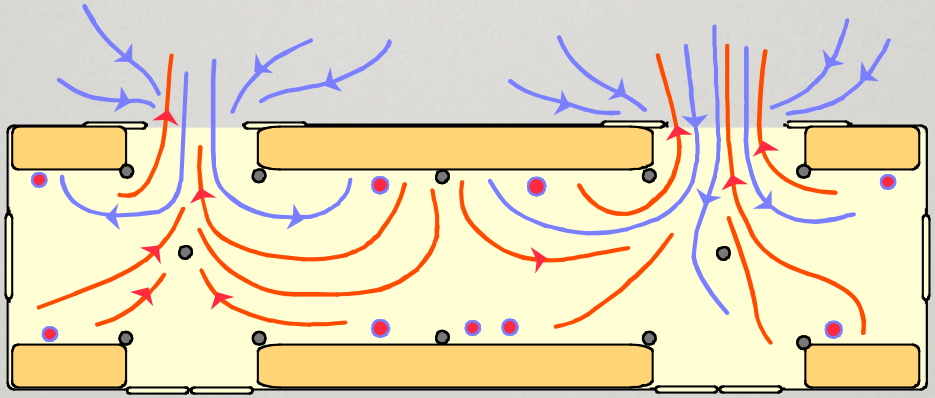
Design approaches 2



- The flow of traffic through the car

  energy exchange - people's movement makes the train lively

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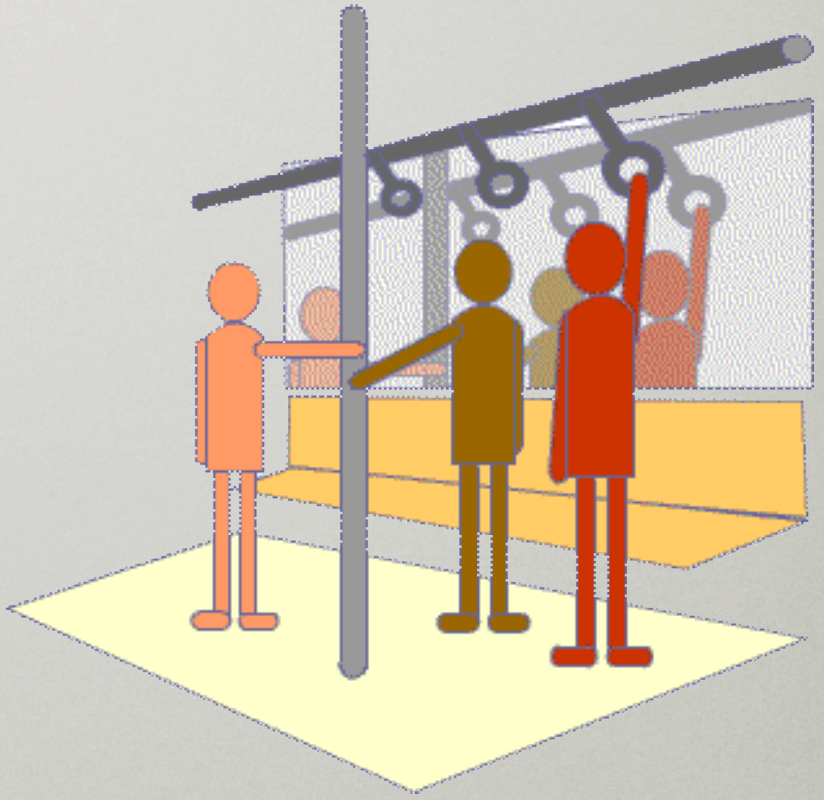
Design approaches 3



- Glass window

  memory - everyone is reflected on the window and leaves a transient record

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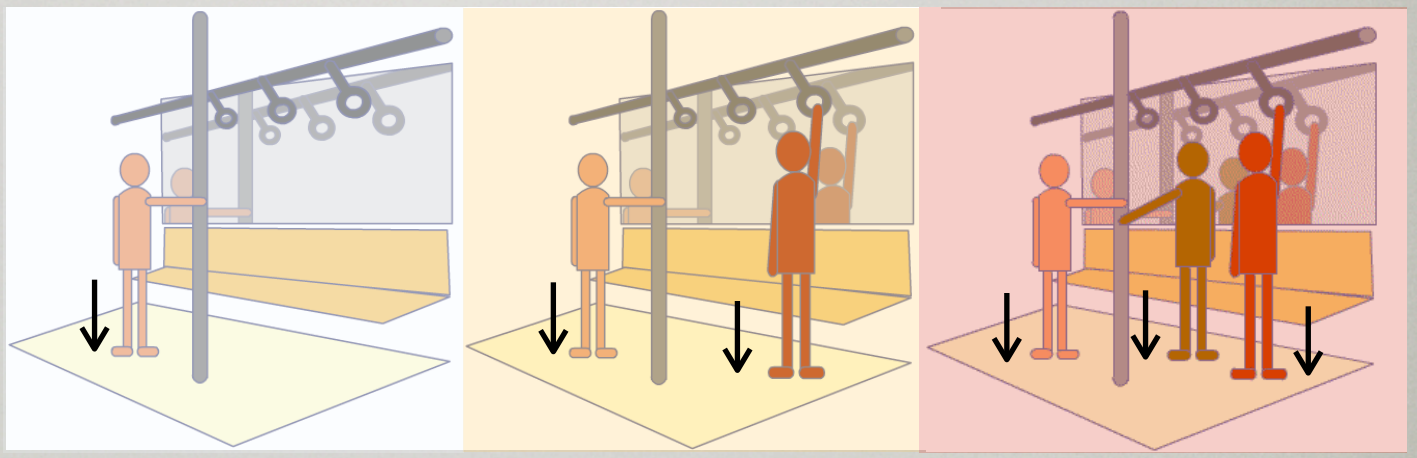
Design approaches 4



- Floor

  skin - sensing weight and pressure on it

- Lighting

  mood - changing with time and different events

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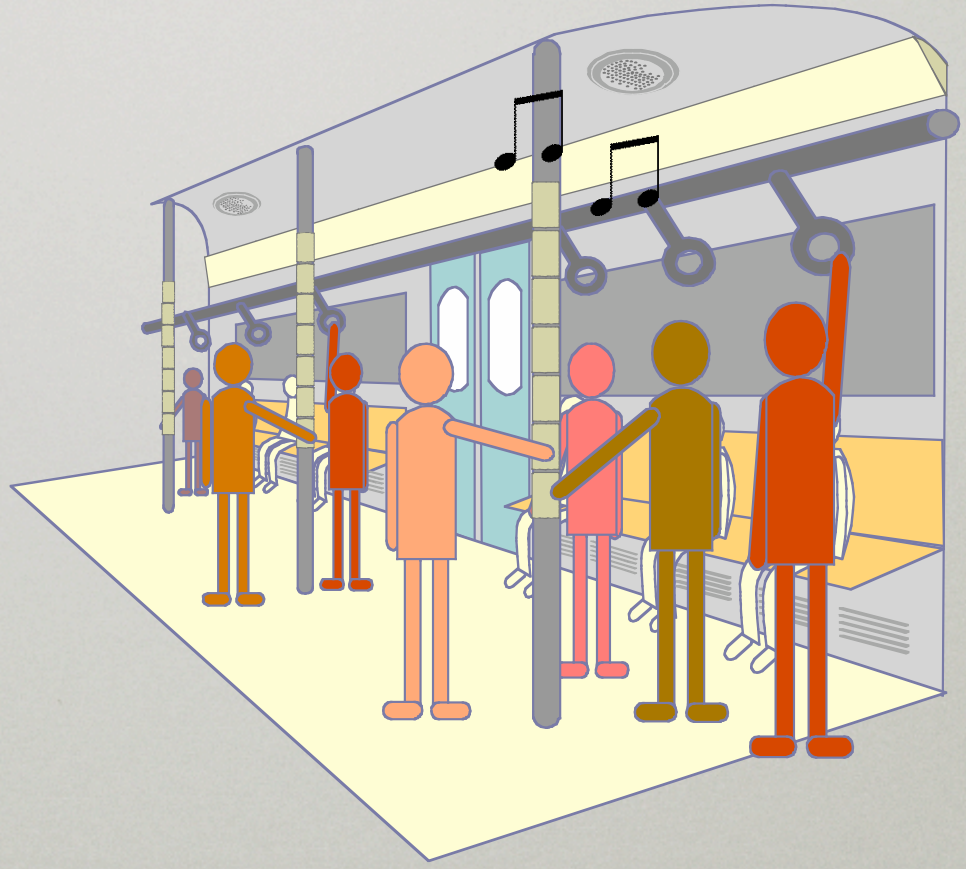
Design approaches 5



- Voice

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Prototype :: 3 steps

- User scenario: questions about users' reaction to the interactive design they experienced in the subway car
- Look and feel: explanation how the subway car changes its features according to users' collective behaviors
- Implementation: questions of related techniques and components of the subway car design -- how it actually works

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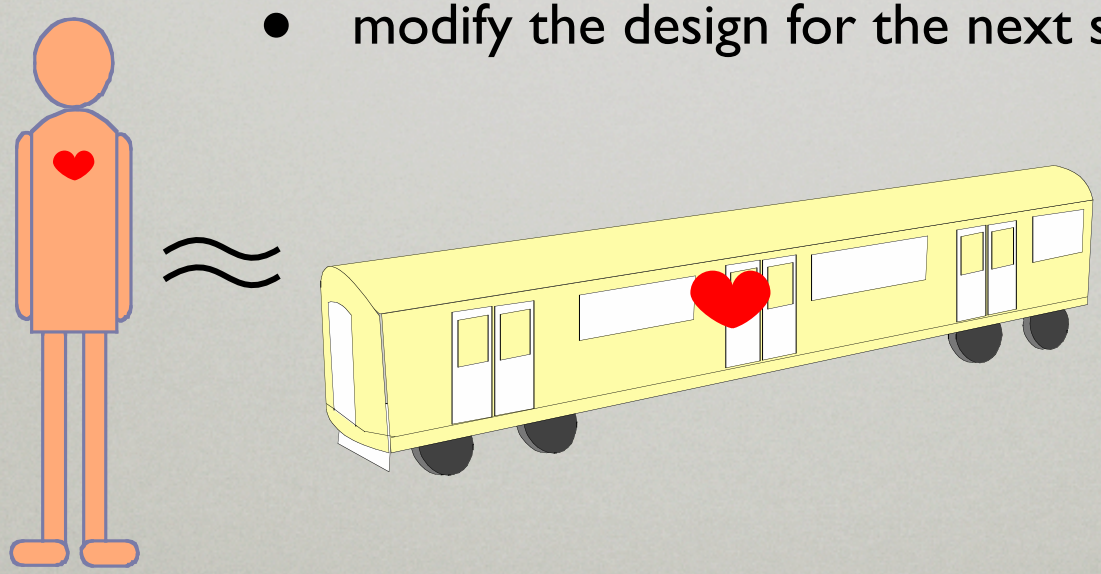
Prototype I :: Goal

- test the interactive design - heartbeat & breathing
- understand users' reaction
- modify the design for the next step



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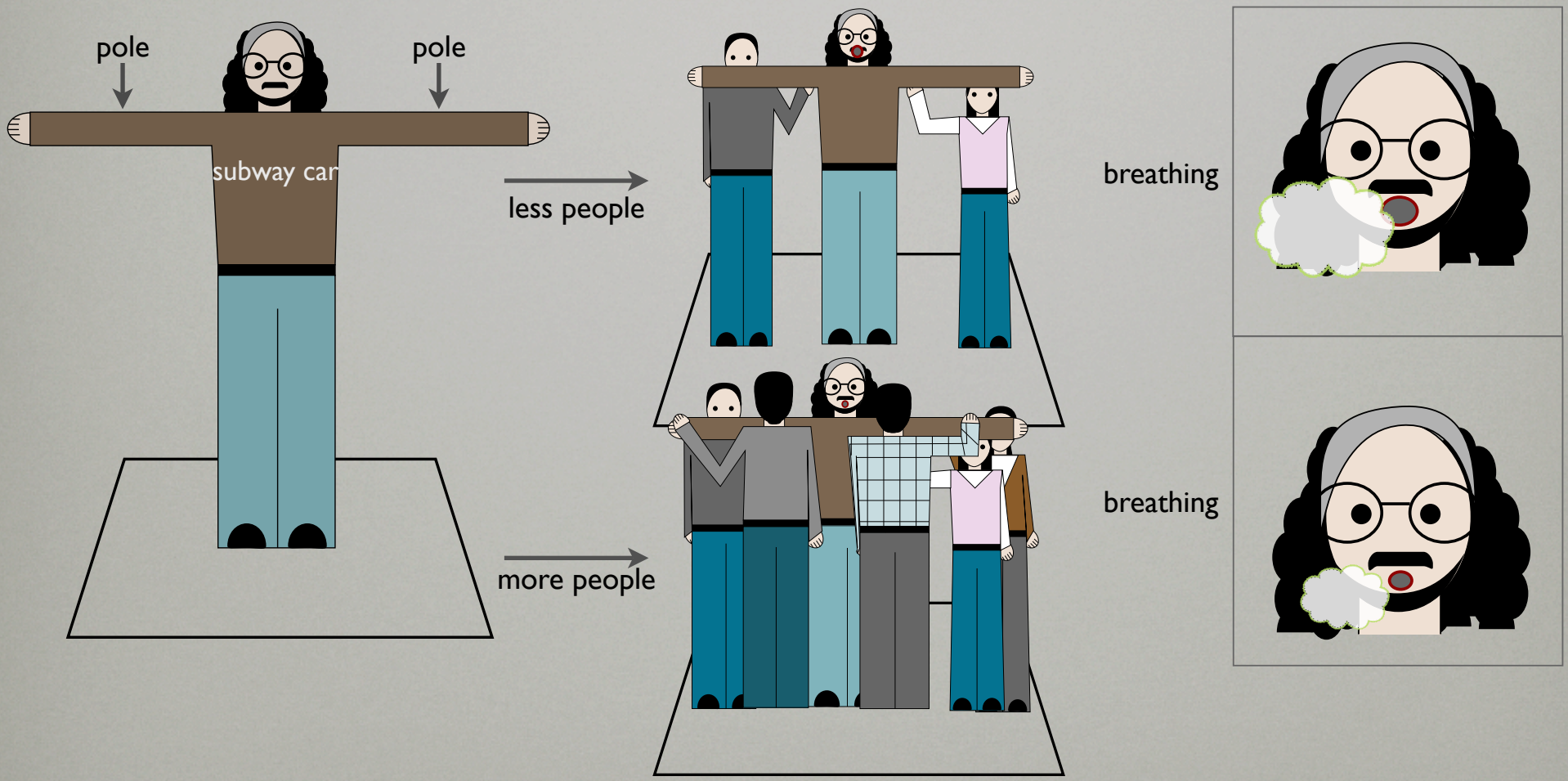
Prototype I :: rough design sketches



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Prototype I :: questions for passengers

- Were you aware of the existence of other people in the space?
- Did you feel your collective behaviors affect the changes of the train environment?
- Did you think the breathing is obvious enough?

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Prototype I

Feedback

- They thought it's a fun experience
- They were aware the existence of others & the rhythm changes of breathing
- They couldn't relate the heartbeat to the breathing and as a collective behavior
- They were aware of the pressure changing between more and less people in the space
- Suggested playing with some audio or visual effect would be more obvious

Solutions

- The idea of " heartbeat-breathing" is not obvious enough for users to feel the interaction and the collective behaviors due to the technology limitation.
- Think about distinguishing the difference in the number of people holding the pole as input and using visual or/and sound effect as output

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Prototype II :: rough design sketches

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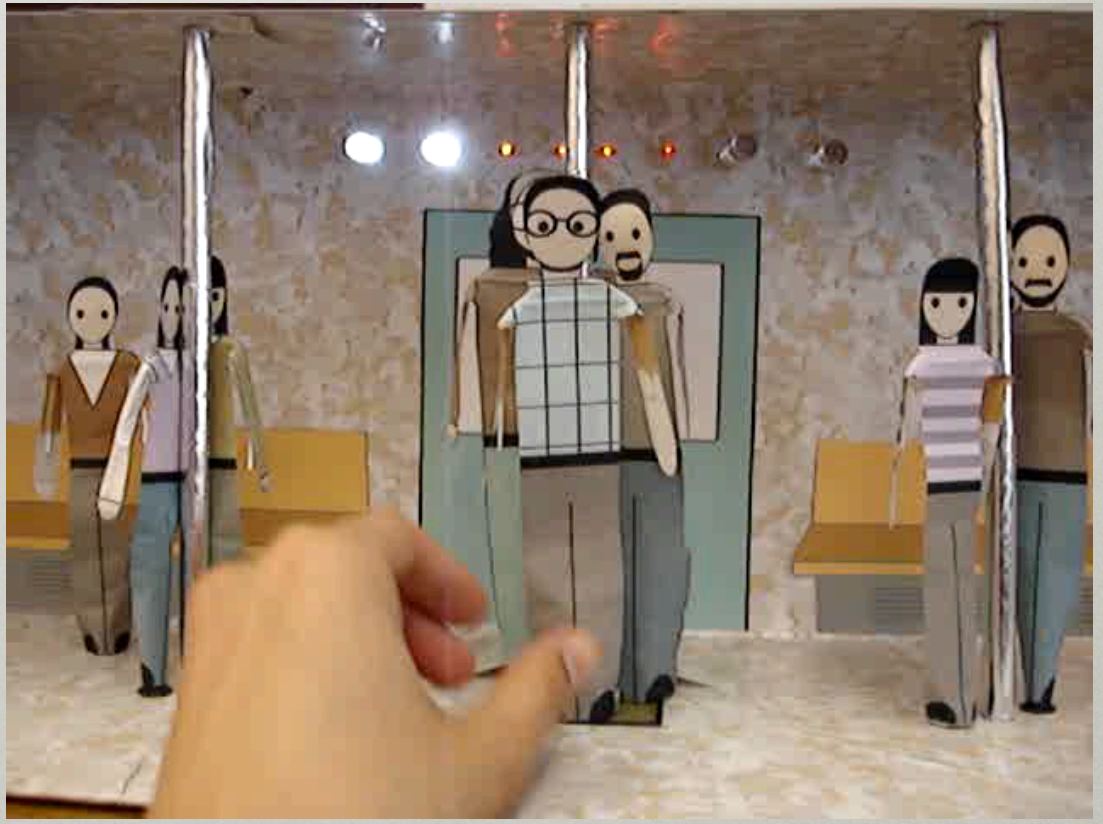
Prototype III :: Building a subway car



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Conclusion

Several design approaches were proposed in the early stage of the project, and two of them were implemented as prototypes in the end. Current technologies are able to deliver some of my ideas although I need to do more research in the future in order to learn the most appropriate tools to realize my design concepts.